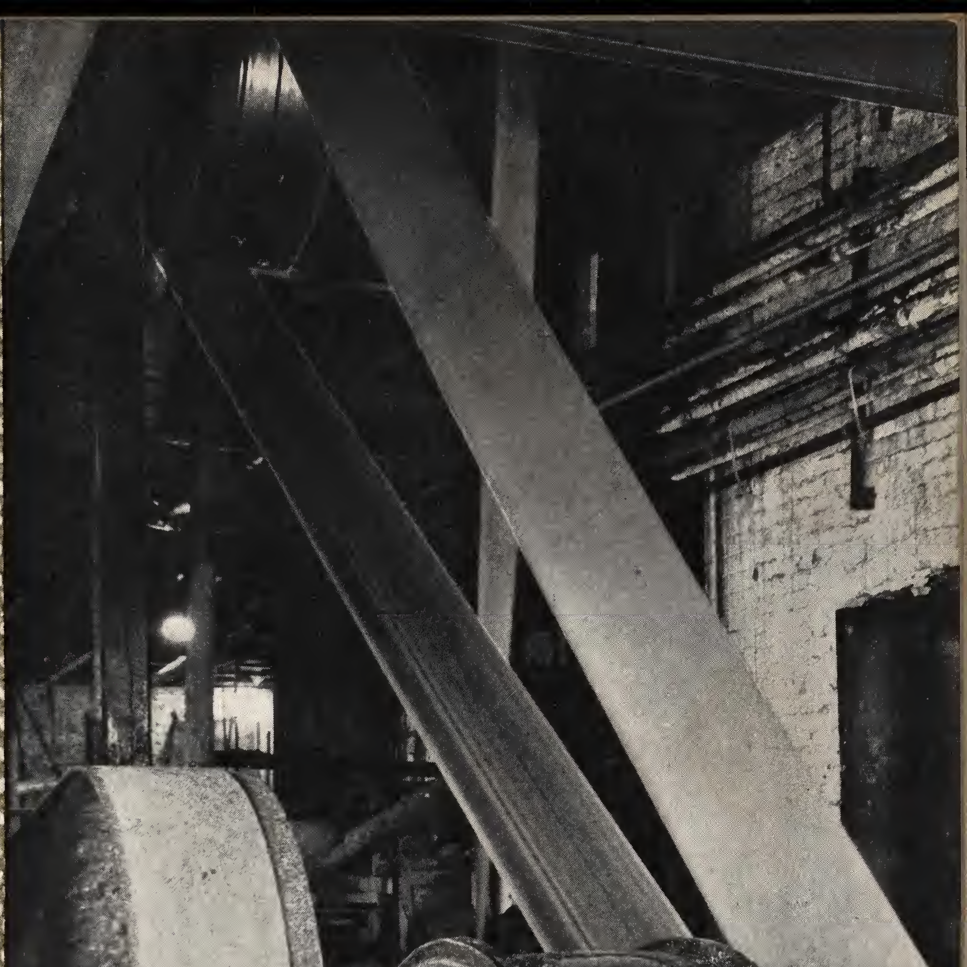

B.F. Goodrich

ngineering Data, Industrial Rubber Goods

A GUIDE TO SELECTION OF BELTING, HOSE AND OTHER PRODUCTS • •

THE B. F. GOODRICH RUBBER CO.

Manufacturers of Mechanical Rubber Goods Since 1870

AKRON, OHIO

• • MECHANICAL GOODS DISTRICT OFFICES AND WAREHOUSES • •

ATLANTA, 376 Nelson St., S. W.
BOSTON, 109 Brookline Ave.
BUFFALO, 197 Van Rensselaer St.
CHICAGO, 310 W. Taylor St.
CINCINNATI, 408 Commercial Sq.
DALLAS, 4136 Commerce St.
DENVER, 2625-35 Walnut St.
DETROIT, 2792 E. Grand Blvd.
KANSAS CITY, 2422 Broadway
LOS ANGELES, 1931 Bay St.
NEW YORK, 66 Reade St.
PHILADELPHIA, 23rd and Allegheny Ave.
ST. LOUIS, 3435 Chouteau Ave.
SAN FRANCISCO, 355 Brannan St.
SEATTLE, 1049 Railroad Ave., S.

EXPORT: THE INTERNATIONAL B. F. GOODRICH CORPORATION

For Distributors of Goodrich Mechanical Rubber Goods, see page 25

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Automobile tires, tubes, accessories
Battery jars and containers
Billiard table cushions
Bradley hammer cushions
Channel rubber
Corks and stoppers
Crude rubber, washed and milled
Dredging sleeves
Drug sundries
Engraving gum
Footwear
Forming tanks and racks
Grease hose
Grinding mill liners
Hard rubber goods—special
Heels, soles and taps
Hydraulic brake hose
Milking machine parts
Mill and calender aprons
Molded goods—special
Municipal fire department hose
Offset lithographers' blankets
Oil well drilling and pumping accessories
Paper machinery parts
Pipe line rings
Pipe—hard rubber
Plumbing equipment parts
Printers' rollers
Railroad equipment hose and belting
Shoe cloth
Stamp gum
Surgical goods
Tanners' bolsters
Thread
Tiling
Type gum
Typewriter platens

GOODRICH TRANSMISSION BELTING • • • • •

FACTS ABOUT RUBBER BELTING

The best rubber belting today, as represented by Goodrich Highflex, is more than twice as good as the best rubber belt 10 years ago. It is 60% cotton. Rubber is forced into the weave of the cotton under 14 tons per square foot pressure. No other filler compares with rubber in permanent elasticity. Rubber is superior in resistance to wear and moisture. Since the cotton is sealed by rubber the belt operates with much less stretching or shrinking than other belt materials.

Rubber belting averages 40% lower in first cost than leather belting. Rubber belting is uniform in thickness, width and weight. It is made straight and runs straight.

TABLE NO. 1—DATA AND LIST PRICES—HEAVY RUBBER BELTS

Size of belt, in. ply	*Horsepower capacity at						**Minimum pulley diameter, in., at			Leather belt equivalent	List price per foot
	1000 F.P.M.	2000 F.P.M.	3000 F.P.M.	4000 F.P.M.	5000 F.P.M.	6000 F.P.M.	1000 F.P.M.	3000 F.P.M.	5000 F.P.M.		
1 — 3	1.2	2.5	3.7	5	5.3	5.1	2	3	4	Single	$0.20
1½ — 3	1.8	3.7	5.5	7.5	7.9	7.7	2	3	4	Light single	.31
1½ — 4	2.5	5	7.5	10	10.6	10.3	4	5	6	Heavy single	.36
2 — 3	2.5	5	7.5	10	10.6	10.3	2	3	4	Light single	.39
2 — 4	3.3	6.7	10	13	15	14	4	5	6	Heavy single	.46
2½ — 3	3.1	6.2	9.4	12.5	14	13	2	3	4	Light single	.48
2½ — 4	4.2	8.4	12.5	16.5	18.5	17.5	4	5	6	Heavy single	.56
3 — 3	3.8	7.5	11.3	14.8	16	15.4	2	3	4	Light single	.55
3 — 4	5	10	15	20	22	21	4	5	6	Heavy single	.65
3½ — 4	5.8	11.6	17.5	23.5	25.5	24.5	4	5	6	Heavy single	.76
3½ — 5	7	15	22	30	32	31	6	8	10	Double	.95
4 — 3	5	10	15	20	22	21	2	3	4	Light single	.70
4 — 4	6.7	13	20	26	28	27	4	5	6	Heavy single	.82
4 — 5	8.3	17	25	34	36	35	6	8	10	Double	1.03
4½ — 4	7.5	15	22.5	30	32	31	4	5	6	Single	.92
5 — 4	8.3	17	25	34	36	35	4	5	6	Single	1.02
5 — 5	11	21	31	42	44	43	6	8	10	Double	1.28
6 — 4	10	20	30	40	42	41	4	5	6	Single	1.22
6 — 5	13	25	38	50	53	52	6	8	10	Double	1.53
6 — 6	15	30	45	60	64	62	10	12	15	Heavy double	1.83
7 — 4	11.7	23	35	46	48	47	4	5	6	Single	1.43
7 — 5	15	29	45	58	62	61	6	8	10	Double	1.79
8 — 4	13	27	40	53	57	55	4	5	6	Single	1.54
8 — 5	17	33	50	66	71	69	6	8	10	Light double	1.93
8 — 6	20	40	60	80	86	84	10	12	15	Double	2.31
8 — 7	23.2	46.7	70	93	100	97	14	17	21	Double	2.70
8 — 8	26.5	53.5	80	106	114	111	17	22	27	Triple	3.08
10 — 5	21	42	62	83	89	87	6	8	10	Light double	2.40
10 — 6	25	50	75	99	106	103	10	12	15	Double	2.88
10 — 7	29	58	88	115	123	119	14	17	21	Heavy	3.36
10 — 8	33	66	101	131	140	135	17	22	27	Triple	3.84
12 — 5	25	50	75	99	106	103	6	8	10	Light double	2.88
12 — 6	30	60	90	119	127	123	10	12	15	Double	3.45
12 — 7	35	70	105	139	148	144	14	17	21	Double	4.03
12 — 8	40	80	120	159	170	165	17	22	27	Triple	4.60
14 — 6	35	70	105	139	148	144	10	12	15	Double	4.04
14 — 7	41	82	122	162	174	168	14	17	21	Heavy double	4.71
14 — 8	47	93	140	186	200	194	17	22	27	Triple	5.38
16 — 6	40	80	120	159	170	165	10	12	15	Double	4.62
16 — 8	53	107	160	213	229	222	17	22	27	Triple	6.16
18 — 6	45	90	135	180	192	186	10	12	15	Double	5.20
20 — 8	66	134	200	266	284	276	17	22	27	Triple	7.68

Endless Belts—For belts built endless at the factory, add the price of ten extra feet.

***Horsepower**—Applies to Highflex, Commander or Drivesall. Calculated for 180 degrees of contact on smaller pulley—deduct 10% for 160 degrees; add 10% for 200 degrees; 15% for 220 degrees. Deduct 10% if smaller pulley is less than 8 in. diameter.

Overload—Maximum horsepower should be the guide. If overload of motor is not known, add 25% to 50% to horsepower rating on motor plate. To convert kilowatts to horsepower, multiply by 1.34. Extra margin should be allowed in selecting belts for vertical drives, cone drives, crossed drives, tight side above, excessive dust, water or other conditions which impair full, smooth pulley contact.

****Minimum Pulley Diameter**—Table applies to Highflex belts joined with fasteners. For factory built endless belts, pulleys may be 10% smaller. Pulleys should be 10% larger for Commander belts; 20% larger for Drivesall belts.

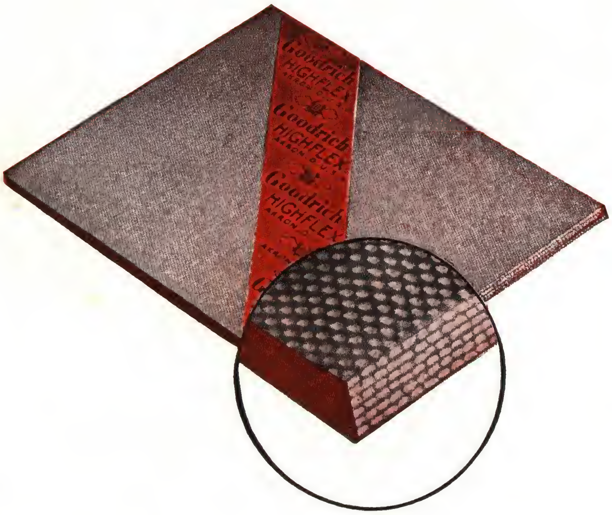
F.P.M.—To figure speed of belt in feet per minute (F.P.M.), multiply diameter of pulley in inches by revolutions per minute (R.P.M.) of the same pulley, and then divide by 3.8.

Other Sizes—Table shows most commonly used sizes of rubber belts. Horsepower and prices of intermediate and larger sizes are in proportion. Belts can be furnished in sizes up to 60 in. 12 ply.

HIGHEST QUALITY TRANSMISSION BELTING for SEVERE SERVICE:

HIGHFLEX

Goodrich Highflex was the original "raw edge" heavy duty rubber belt. Its success is indicated by numerous imitations of its appearance and construction. It has been progressively improved so that Highflex incorporates the latest research and development in transmission belting. Its successful performance is due chiefly to the tan Highflex rubber with which the belt is impregnated. This rubber is scientifically compounded to withstand constant flexing, heat and wear, without loss of sealing properties or permanent elasticity.



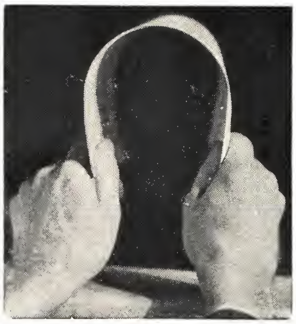


Fig. 1

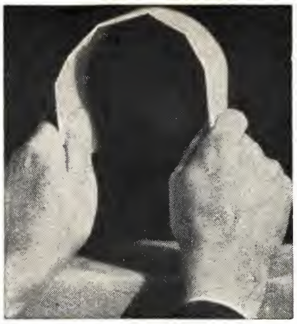
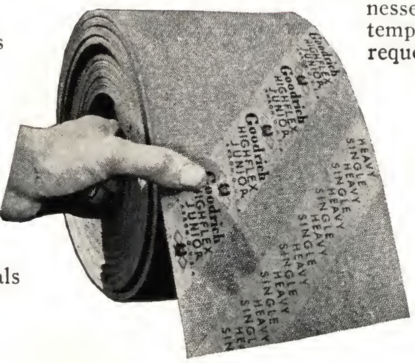


Fig. 2

The unhampered action of the Highflex construction can be demonstrated by bending several layers of paper with the fingers (Fig. 1). When viewed from the edge, they assume a natural uniform curve. On the other hand, if the sheets are folded and then bent (Fig. 2), it will be noticed that the fold distorts the curve and impedes free movement of the individual layers to a marked degree.

For the past eight years Highflex has made outstanding performance records in all industries on difficult drives including:

Cone Pulleys
Dryer Sections
Water Pumps
Beaters
Dry Pans
Pug Mills
Blowers
Tube Mills
Crushers
Fans
Ball Mills
Oil Well Drilling and Pumping
Air Compressors
Extractors
Planers
Edgers
Gang Saws
Hogs
Grinders
Lathes
Mine Pumps
Hot Saws
Cold Saws
Sugar Centrifugals
Looms



FOR TEXTILE MACHINERY, MACHINE TOOLS, FLOUR MILLS, ETC.:

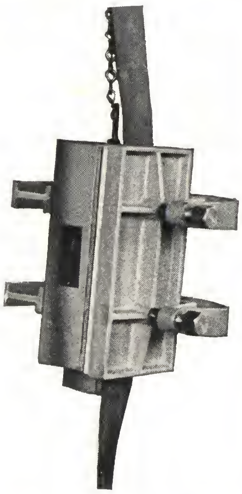
HIGHFLEX JUNIOR

Highflex Junior is designed to replace leather belts in the narrower widths—up to 6 in. It is similar to its older brother, Highflex, except that it is made of a special cotton duck. This special duck construction is adapted to easy splicing by step joints, which can be vulcanized endless on the pulleys *by the user* with a simple portable electric vulcanizer. May also be joined effectively with wire lacings or other metal fasteners. Highflex Junior incorporates the same seamless square edge construction as regular Highflex and is impregnated with the same Highflex rubber. Absolutely uniform in thickness and weight.

Highflex Junior is made in weights corresponding to leather belt thicknesses. Prices on vulcanizers, templates and tools quoted on request.

LIST PRICES HIGHFLEX JUNIOR BELTING
(Standard Leather List)

Size, in.	Single	Double
1	$0.24	$0.48
1½	.36	.72
2	.48	.96
2½	.60	1.20
3	.72	1.44
3½	.84	1.68
4	.96	1.92
4½	1.08	2.16
5	1.20	2.40
5½	1.32	2.64
6	1.44	2.88



Heintz Electric Vulcanizer Completing Highflex Junior Belt Joint on Pulleys Two Hours After Job Is Started

FOLDED EDGE TRANSMISSION BELTING:

COMMANDER

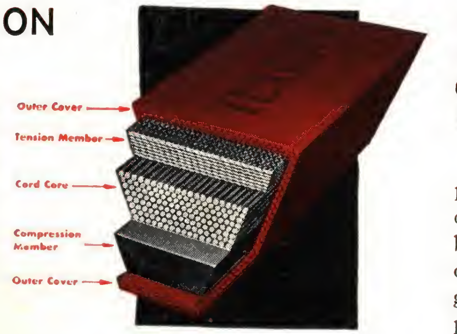
Leading Goodrich brand prior to introduction of Highflex. Highest quality throughout. 32-oz. duck. Gray friction surface. Cost is approximately 20% below Highflex.

DRIVESALL

A dependable quality, red friction surface grade, built on 32-oz. duck. Used on average drives. Cost is approximately 30% below Highflex.

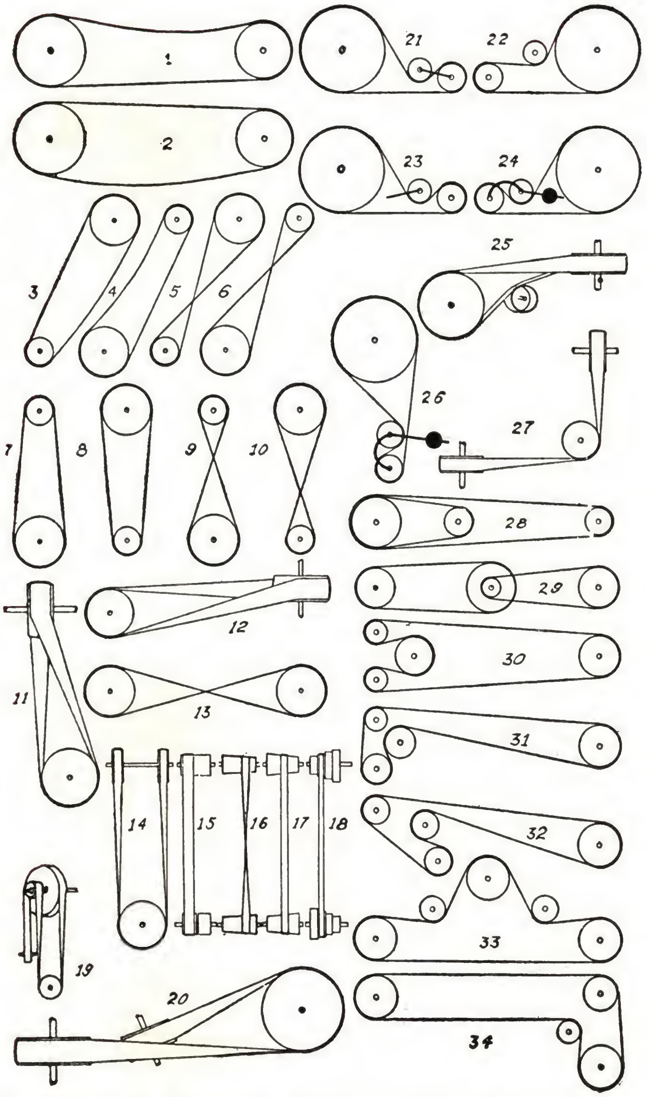
"V" TYPE TRANSMISSION BELTING

Texrope Belts for multiple drives are made by Goodrich under Allis-Chalmers patents for original equipment or replacements on Allis-Chalmers Texrope drives. Replacement orders need specify only the belt serial number as it appears on the old belt, e.g., serial number 71-A.



DRESSING FOR RUBBER BELTS: GOODRICH PLASTIKON BELT DRESSING

Made in stick form—one pound per stick. Contains no grease or other ingredients harmful to rubber. A very small quantity immediately imparts gripping power to glazed surfaces of old belts. List price $1.00 per pound.



DIRECTIONS FOR ORDERING TRANSMISSION BELTS

Full rolls contain one continuous piece approximately 450 feet to 570 feet long; half rolls 225 to 290. Belts may also be ordered in exact length for individual drives.

When in doubt as to belt required for given drive, submit as much as possible of the following information:

Length of belt, or distance between shaft centers
Dimensions of all pulleys
Revolutions per minute of at least one pulley
Is tight or driving side of belt on top or bottom
Horsepower—maximum and average
Is drive pulley on a motor, engine, or shaft
If on motor or engine, give horsepower rating
Overload per cent in starting—in running
Machine or machines driven
Unusual conditions such as excessive oil, fumes, moisture, fork shifters, flanges on pulleys, dust, heat, misalignment.
Type of drive—indicate by a number in the adjoining Goodrich chart of belt drives.
Type of belt previously used, length of service, and troubles experienced, if any.

ENDLESS BELTS

All trouble with fasteners or splices is eliminated by having endless belts made to order for your drive. By a special Goodrich process these belts are actually built in the factory in one piece with no weak spots or splices. In ordering, specify exact steel tape measurement around the pulleys. If there is an idler, take measurement with idler in normal position. Goodrich district offices will make necessary allowances for stretch in entering factory order. Endless belts are subject to a manufacturing tolerance of three fourths of one per cent plus or minus required length. Minimum thickness of endless belts is three ply for Highflex and four ply for folded construction belts.

HOW TO INSTALL

If belt is to operate under atmospheric conditions decidedly different from those in which the belt was stored, satisfactory performance will be insured by loosening the belt, if a roll, and conditioning it by exposing it to the atmosphere in the room where it is to operate, for at least 48 hours before cutting to length.

After belt is properly "conditioned," correct tension is given by allowing 1% for stretch—that is by cutting ⅛ in. per ft. on length shorter than steel tape measurement around the pulleys. (For vertical drives, allow $\frac{3}{16}$ in. per ft. instead of ⅛ in.)

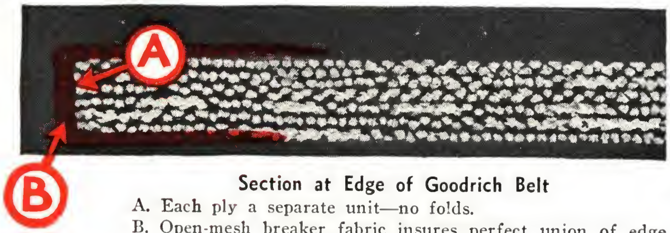
Make ends square and use steel square as guide in cutting.

When using rawhide lacing make punch holes as small as possible. When using wire lacing or metal fasteners be sure to employ the size recommended by the manufacturer of lacing for the thickness of the belt and the diameter of the pulleys.

GOODRICH CONVEYOR BELTING

The difference in various qualities of Goodrich Conveyor Belts lies in the quality of the elastic rubber friction with which the cotton fabric is impregnated, also in the quality of the rubber cushion which constitutes the covers and edges. The quality of friction rubber is not merely a matter of adhesion but of retaining a permanent elasticity. The quality of the cover compounds differ according to their capacity to withstand abrasion, heat, corrosion, etc.

The Highflex Edge—All grades of Goodrich conveyor and elevator belt 12 in. and over, 4 ply or thicker, with one cover $\frac{1}{16}$ in. or thicker, are made with the "Highflex bonded edge." Each ply of fabric is terminated at the edge, without folds. This eliminates nearly all seams. The edge cushion is molded square and bonded to the plies by a layer of open-mesh breaker fabric. This unique feature assures firm adhesion of edge cushion to resist gouging and other abuse at this most vulnerable point of a conveyor belt.



Section at Edge of Goodrich Belt

A. Each ply a separate unit—no folds.

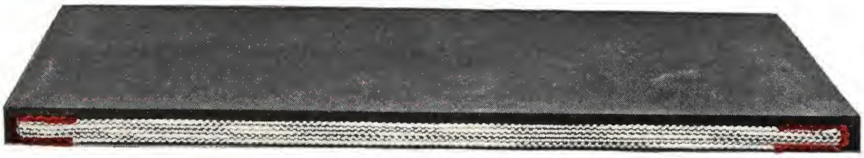
B. Open-mesh breaker fabric insures perfect union of edge cushion with body of belt.

Red Lines in Cuts Indicate Cord Breaker Fabric

STANDARD QUALITY FOR GENERAL SERVICE:

MAXECON

Name denotes "maximum economy." 28-oz. duck in all widths unless 32 oz. is specified.



LIST PRICES ON SIZES OF MAXECON CONVEYOR BELT (28-OUNCE DUCK) CARRIED IN FACTORY STOCK

Width, in.	No. of plies	Thickness, in.		List price per foot
		Top cover	Bottom cover	
12	4	$\frac{1}{16}$	$\frac{1}{32}$	$1.39
14	4	$\frac{1}{16}$	$\frac{1}{32}$	1.64
14	4	$\frac{3}{32}$	$\frac{1}{32}$	1.76
16	4	$\frac{1}{16}$	$\frac{1}{32}$	1.86
16	4	$\frac{3}{32}$	$\frac{1}{32}$	2.00
16	4	⅛	$\frac{1}{32}$	2.16
16	5	⅛	$\frac{1}{32}$	2.52
18	4	$\frac{1}{16}$	$\frac{1}{32}$	2.09
18	4	⅛	$\frac{1}{32}$	2.43
18	4	⅛	$\frac{1}{16}$	$2.62
18	5	⅛	$\frac{1}{32}$	2.83
20	4	$\frac{1}{16}$	$\frac{1}{32}$	2.32
20	5	$\frac{1}{16}$	$\frac{1}{32}$	2.75
20	5	⅛	$\frac{1}{32}$	3.14
24	4	$\frac{1}{16}$	$\frac{1}{32}$	2.78
24	4	⅛	$\frac{1}{32}$	3.25
24	4	⅛	$\frac{1}{16}$	3.49
24	5	⅛	$\frac{1}{32}$	$3.77
24	5	⅛	$\frac{1}{16}$	4.00
24	6	⅛	$\frac{1}{32}$	4.28
30	5	⅛	$\frac{1}{32}$	4.71
30	6	⅛	$\frac{1}{32}$	5.36
36	6	⅛	$\frac{1}{32}$	6.43
42	4	$\frac{1}{16}$	$\frac{1}{32}$	4.89
42	5	$\frac{1}{16}$	$\frac{1}{32}$	5.77

EXTRA QUALITY FOR GENERAL SERVICE:

2002

Same quality fabric carcass as Maxecon but with higher grade cover, 28 or 32-oz. duck. Cost averages approximately 5% above Maxecon.

2002

SUPER QUALITY FOR SEVERE SERVICE:

LONGLIFE

Superior quality friction with extra tough cover for handling ore, sharp rock, wet gravel and other severe duty. Made on 28-oz. or 32-oz. duck, as specified by the buyer. Cost averages approximately 12% above Maxecon.

Longlife

SUPREME QUALITY FOR HEAVIEST DUTY:

Super Longlife

SUPER LONGLIFE

For unusually severe or abusive service in mines and rock product plants, also for handling coke. The cover is Armorite rubber, the toughest known rubber compound with superlative quality friction. Built on 28, 32 or 36-oz. duck, as specified by the buyer. Extra reinforcement of breaker fabric inserted in cover to insure against damage. Cost averages approximately 22% above Maxecon.

SPECIAL QUALITY FOR HIGH TEMPERATURES:

GOODRICH HOT MATERIAL

The friction and cover are especially compounded for heat resistance, particularly for small size materials. Made in various weights of duck. Cost averages approximately 5% above Maxecon.

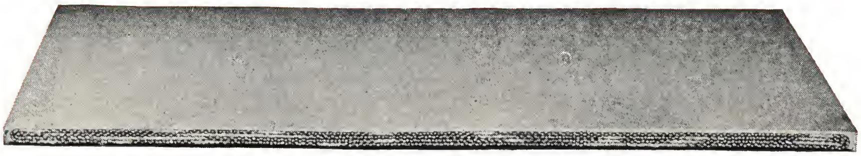
FOR SERVICE RECOMMENDATIONS SEE PAGE FOLLOWING

FOR FOOD PRODUCTS: WHITE COVER

For handling bulk fruits and vegetables in canning factories. Cream white rubber cover resists fruit juices and promotes cleanliness.

Built on 24 oz. or 28 oz. duck.

Cost averages approximately 15% above Maxecon.



SPECIAL QUALITY FOR GRAIN HANDLING: CARIGRAIN

Especially designed for service in large grain elevators.

Built on 28 oz. duck.

Cost averages approximately the same as Longlife grade.

PULLEY LAGGING

Pulley lagging is made like a conveyor belt without a back cover. Two plies of duck and rubber cover ⅛ in. thick. Can also be furnished with $\frac{1}{16}$ in. cover. Applied to pulley with countersunk bolts.

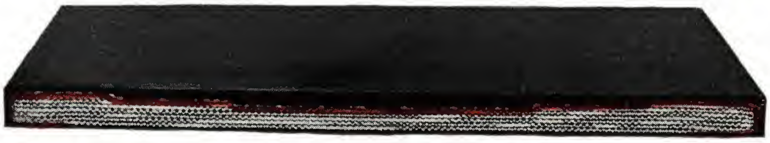
BREAKER FABRIC IN COVERS

When belt covers are subject to severe gouging, we recommend that orders specify "Breaker fabric in top cover." This can be provided at no increase in cost. This serves to "tie" the cover to the carcass. The position of the breaker fabric is illustrated by the red lines in the cuts. It is always used for Super Longlife and can be furnished in Maxecon, 2002, Longlife and Hot Material, when specified, at no extra charge.

STEPPED PLY CONSTRUCTION

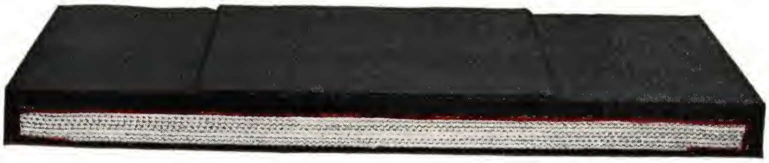
Any grade of rubber covered conveyor belt can be furnished in this construction when specified. It affords a thicker cover of rubber in the middle of the belt because the plies of fabric are eliminated at this point. Inasmuch as this detracts from the working strength of the belt, this construction is not recommended when lengthwise tension on belt is very high.

Price is the same as the average plies and cover thickness of regular construction.



REINFORCED COVER

Rubber cover is built up to extra thickness in the middle of the belt. Recommended for conditions where severe abrasion tends to wear out the belt rapidly in the middle. Not suitable for tandem drives.



CONVEYOR BELT SERVICE RECOMMENDATIONS

Selection of the grade of conveyor belt to afford best economy on a given installation is a complex problem. For new installations we recommend that all conditions be submitted to Goodrich engineers for special recommendations. In the case of replacements, an examination of the old belt will serve as the best guide. If it stretched excessively more plies are needed. If top or bottom covers, or both, wore out while the fabric carcass was intact, better quality or thicker covers are indicated. If plies are separated a higher quality friction would prove economical.

The requirements of a belt are determined not only by the nature of the material, but also nature of feed, length of conveyor, alignment, tripper and tension. Exposure to elements, condition of idlers, care in lubrication are all features to be considered. If the loading and mechanical conditions are ideal, Maxecon grade can be used even for heavy materials. With unfavorable mechanical conditions Super Longlife might be required to resist abuse even for light materials.

Generally speaking the various grades are most commonly used for the following conditions:

MAXECON

Ashes
Brick (except off-bearing)
Small Castings
Bagged Cement
Finished Cement
Clay
Coal
Wet Concrete
Earth
Garbage
Boxed Material
Dry Gravel
Hog Fuel
Plaster of Paris
Refuse
Salt
Sand
Crushed Shale
Snow
Crushed Stone
Sulphur
Vegetables
Wood Chips
Wood Pulp

2002 GRADE

Ashes
Castings
Wet Char
Coal
Wet Concrete
Earth
Grading and Ditching Machines
Gravel
Glass—Fine Cullet
Iron Ore
Limestone up to 8 in.
Sand
Crushed Shale
Slag
Soda Ash—Cold
Crushed Stone
Dry Refined Sugar
Tailings
Trap Rock

LONGLIFE

Ashes
Castings
Wet Char
Copper Ore
Cossettes
Gold Dredging
Anthracite Coal
Glass—Fine Cullet
Gold Ore
Wet Gravel
Iron Ore
Limestone up to 8 in.
Slag
Crushed Stone
Lump Stone
Dry Refined Sugar
Raw Sugar
Wet Refined Sugar
Tailings
Trap Rock

SUPER LONGLIFE

Coke
Copper Ore
Gold Dredging
Gold Ore
Glass—Coarse Cullet
Limestone 8 in. and over
Poidometers
Coal Projectors
Quartz
Slag
Lump Stone
Tailings

HOT MATERIAL

Generally designed for fine or medium materials which *heat the belt* up to a temperature of 150° or over, but not more than 200° F.—including cement clinker, hot char, fullers' earth, phosphate, soda ash, sinter, salt, crushed stone, etc.

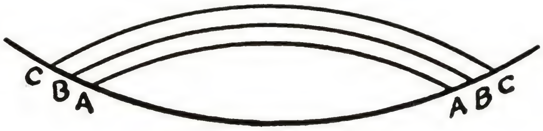
CONVEYOR BELT DATA

WIDTH

For fine material, width is determined by required capacity. For lump material, the chute must be large enough to prevent choking and the belt correspondingly wider.

TABLE NO. 2

Width of belt, in.	12	18	24	30	36	42	48
Uniform sized material, in.	1½	3	4½	7	9	11	14
Maximum pieces unsized material, in.	2	4	8	14	18	20	24



How Reduced Speed Saves Belts

Cross section of 24-in. belt carrying 140 tons of crushed coal per hour.

AA = Size of load at 500 ft. per minute.

BB = Size of load at 400 ft. per minute.

CC = Size of load at 300 ft. per minute.

When fully loaded at CC the belt passes under the loading chute ⅗ as often as when loaded at AA, with 40% less wear on the rubber cover.

SPEED

Speed should be the slowest that will carry the load, thus keeping the belt full and reducing breakage of material and wear of belt. Maximum speed in average practice is indicated by the following table:

	Width		
	Up to		Over
	16 in.	24 in.	36 in.
Feet per minute	300	450	600

NUMBER OF PLIES

Table No. 3 below will assist in determining the required number of plies to withstand tension and thereby avoid excessive stretch.

When tension is not a factor, it is necessary to have only enough plies to impart sufficient body so that the belt will not crease between idler pulleys. Sizes listed in Column A, Table No. 3, represent good practice for all except very light materials. In grain belts 4-ply is good practice for widths up to 36 in.

EXPLANATION OF TABLE

DUCK WEIGHT (Column B)

Refers to number of ounces per yard of cotton duck 42 in. wide. Except for extreme tension on very heavy materials, 28-oz. duck is good practice in all belts 30 in. wide and under,

TABLE NO. 3, CONVEYOR BELT DATA

Belt		C	D		E				F		G				H	
		Maximum working tension, lbs.	Maximum tons per hour at 100 ft. per minute		Horsepower required per ft. center to center distance at 100 f.p.m. belt speed				Horsepower required per ft. vertical lift 100 f.p.m. belt speed		Maximum horsepower of belt at 100 f.p.m.				Spacing of idlers top row, in.	
A Width and plies	B Weight of duck				Plain bearings		Roller bearings				Simple drive		Tandem drive			
			Coal	Stone	Coal	Stone	Coal	Stone	Coal	Stone	Bare pulleys	Lagged pulleys	Bare pulleys	Lagged pulleys	Coal	Stone
12–4 ply	28	1200	12	24	.0029	.0036	.0019	.0024	.012	.024	2	2.3	3	3.3	60	54
14–4 “	28	1400	16	33	.0036	.0047	.0024	.0031	.016	.033	2.3	2.7	3.5	3.9	60	54
16–4 “	28	1600	21	43	.0043	.0056	.0029	.0037	.021	.043	2.7	3	4.1	4.4	60	54
16–5 “	28	2000	21	43	.0043	.0056	.0029	.0037	.021	.043	3.3	3.8	5.1	5.5	60	54
18–4 “	28	1800	27	54	.0054	.0070	.0036	.0047	.027	.054	3	3.4	4.6	5	54	48
18–5 “	28	2250	27	54	.0054	.0070	.0036	.0047	.027	.054	3.8	4.3	5.7	6.2	54	48
20–4 “	28	2000	33	66	.0063	.0084	.0042	.0055	.033	.066	3.3	3.8	5.1	5.5	54	48
20–5 “	28	2500	33	66	.0063	.0084	.0042	.0055	.033	.066	4.2	4.8	6.3	6.9	54	48
24–4 “	28	2400	48	96	.0083	.0112	.0056	.0075	.048	.096	4	4.6	6.1	6.6	48	42
24–5 “	28	3000	48	96	.0083	.0112	.0056	.0075	.048	.096	5	5.8	7.6	8.3	48	42
24–6 “	28	3600	48	96	.0083	.0112	.0056	.0075	.048	.096	6	6.9	9.1	9.9	48	42
24–7 “	28	4200	48	96	.0083	.0112	.0056	.0075	.048	.096	7	8	10.7	11.6	48	42
24–7 “	32	4630	48	96	.0083	.0112	.0056	.0075	.048	.096	7.4	8.4	11.2	12.2	48	42
30–5 “	28	3750	75	150	.0116	.0161	.0077	.0107	.075	.150	6.3	7.2	9.5	10.4	48	42
30–6 “	28	4500	75	150	.0116	.0161	.0077	.0107	.075	.150	7.5	8.6	11.4	12.4	48	42
30–6 “	32	4950	75	150	.0116	.0161	.0077	.0107	.075	.150	7.9	9	12.0	13	48	42
30–6 “	36	5400	75	150	.0130	.0175	.0087	.0117	.075	.150	8.3	9.5	12.5	13.7	48	42
30–7 “	28	5250	75	150	.0130	.0175	.0087	.0117	.075	.150	8.9	10	13.3	14.5	48	42
30–7 “	32	5780	75	150	.0130	.0175	.0087	.0117	.075	.150	9.2	10.5	14	15.2	48	42
36–5 “	28	4500	108	216	.0179	.0244	.0119	.0162	.108	.216	7.5	8.6	11.4	12.4	42	36
36–6 “	28	5400	108	216	.0179	.0244	.0119	.0162	.108	.216	9	10.3	13.7	14.9	42	36
36–6 “	32	5940	108	216	.0179	.0244	.0119	.0162	.108	.216	9.5	10.8	14.4	15.7	42	36
36–6 “	36	6480	108	216	.0179	.0244	.0119	.0162	.108	.216	9.9	11.4	15	16.4	42	36
36–7 “	28	6300	108	216	.0179	.0244	.0119	.0162	.108	.216	10.5	12	16	17.4	42	36
36–7 “	32	6830	108	216	.0179	.0244	.0119	.0162	.108	.216	11	12.6	16.8	18.3	42	36
42–6 “	32	6940	147	294	.0226	.0314	.0150	.0209	.147	.294	11	12.6	16.8	18.3	42	36
42–6 “	36	7560	147	294	.0226	.0314	.0150	.0209	.147	.294	11.6	13.3	17.5	19	42	36
42–7 “	32	8100	147	294	.0226	.0314	.0150	.0209	.147	.294	12.9	14.7	19.6	21.4	42	36
42–7 “	36	8820	147	294	.0226	.0314	.0150	.0209	.147	.294	13.5	15.5	20.4	22.2	42	36
48–6 “	32	7900	192	384	.0281	.0395	.0186	.0263	.192	.384	12.6	14.4	19.2	20.8	42	36
48–6 “	36	8640	192	384	.0281	.0395	.0186	.0263	.192	.384	13.2	15.2	20	21.8	42	36
48–7 “	32	9250	192	384	.0281	.0395	.0186	.0263	.192	.384	14.7	16.8	22.4	24.4	42	36
48–7 “	36	10100	192	384	.0281	.0395	.0186	.0263	.192	.384	15.4	17.7	23.4	25.4	42	36
48–8 “	32	10560	192	384	.0281	.0395	.0186	.0263	.192	.384	16.8	19.2	25.6	27.8	42	36
48–8 “	36	11520	192	384	.0281	.0395	.0186	.0263	.192	.384	17.6	20.2	26.6	28	42	36

32-oz. in wider belts. 36-oz. duck is advantageous for heavy rock and ore in extremely wide belts. A special 42-oz. Goodrich duck is now available for extreme tensions.

MAXIMUM WORKING TENSION (Column C)

Based on a unit tension of 25 pounds per inch of width per ply for 28-oz. duck, 27½ pounds for 32-oz. duck and 30 pounds for 36-oz. duck.

MAXIMUM TONS PER HOUR (Column D)

Table is based on short tons of 2000 lbs. Capacity is proportional to speed. Values given for coal are based on a weight of 50 lbs. per cubic foot; for stone 100 lbs. per cubic foot. These capacities allow for some irregularity of feed but are based on a troughed belt loaded 80% of the belt width, as indicated by arc CC in cut at left. If not possible to run belt full, a corresponding margin should be allowed in selecting a width of belt to insure the desired delivery.

HORSEPOWER REQUIRED

The total horsepower required for a fully loaded belt is the sum of the following:

To Overcome Bearing Friction—Multiply values in Column E by the length of conveyor in feet (center to center).

To Lift the Load—Multiply values in Column F by the number of feet difference in elevation between head and tail pulleys. Add five feet for each tripper.

MAXIMUM HORSEPOWER OF BELT (Column G)

These values indicate the maximum horsepower the belt is capable of handling without excessive stretch.

EXAMPLE

What belt would be required to carry 160 tons per hour of crushed coal (maximum size 6 in.), a distance of 400 ft. to an elevation of 75 ft.?

Table No. 2 indicates a minimum width of 24 in. for 6 in. lumps. Column D in Table No. 3 shows that a 24 in. belt will carry 48 tons per hour at 100 f.p.m. It is decided to operate the belt at 400 ft. per minute, which would provide a capacity of 192 tons per hour, allowing a reasonable margin over the required 160 tons. The next step is to compute the horsepower required. For plain bearings this would be .0083 (Column E) x 400 (center to center distance in feet) equals 3.32 (horsepower required to overcome friction at 100 ft. per minute). Add to this .048 (Column F) x 75 (feet of vertical lift) equals 3.6 (horsepower required to lift the load at 100 ft. per minute). 3.32 plus 3.6 equals 6.92 (total horsepower required at 100 ft. per minute). At 400 ft. per minute the required horsepower would be 27.68. In comparing this amount with maximum belt horsepowers in Column G we find it will be necessary to use a five-ply belt with tandem drive, bare pulleys, this belt having a horsepower capacity of 7.6 at 100 ft. per minute or 30.4 horsepower at 400 ft. per minute.

On the other hand, if roller bearings are used, the required horsepower to overcome friction would be .0056x400 equals 2.24. Substituting this value for 3.32 in the foregoing calculation, we have a total required horsepower at 100 ft. per minute of 5.84, permitting us to use a simple drive with lagged pulleys.

TOP COVERS

For fine, light materials 1/32 in. is sufficient. For moderately abrasive fine material 1/16 in. For lump material more or less abrasive a thicker top cover is necessary to take the wear and to cushion belt against blows. One-eighth inch is common practice, increased to 3/16 in. or ¼ in. for abrasive ore and coke.

BACK COVERS

One thirty-second in. is standard. To prevent entrance of moisture due to injury or excessive wear on pulleys, 1/16 in. back cover may prove economical.

STRETCH

Take-up device should allow for 2% elongation of belt in service.

For additional data ask for Goodrich Catalogue Section 2800 "Conveyor and Elevator Belt Practice."

* * *

GOODRICH ELEVATOR BELTING

STANDARD QUALITY FOR GENERAL SERVICE:

MORECON GRADE

For handling sand, clay and similar materials of a moderately abrasive character. Built on 32-oz. duck.

HIGH QUALITY FOR SEVERE SERVICE:

AKRON GRADE

For stone, slag and similar abrasive lump materials. Built on 36-oz. duck. Tough cover. Cost averages approximately 20% above Morecon.

SPECIAL GRADE FOR EXTREME SERVICE:
NEW MINING GRADE

For sharp, wet, granular material. Built on 35.5-oz. hard woven duck. Extra coating of highest quality rubber between plies. Cover is Goodrich Armorite, toughest known rubber compound. Fabric carcass is entirely surrounded by cord breaker fabric network, embedded in cover, indicated by red line in cut, which thoroughly ties rubber to the carcass to resist gouging and other abuse. Average cost is approximately 50% higher than Morecon.

SPECIAL GRADE FOR GRAIN ELEVATORS:
LEGRAIN GRADE

Quality similar to Akron Elevator but usually supplied without rubber cover. Made in two weights, 32-oz. for terminal elevators and 28-oz. for country elevators. Cost approximately 20% above Morecon.

ELEVATOR BELT DATA

NUMBER OF PLIES

The purpose of fabric in elevator belts is:
(1) To resist tension.
(2) To provide sufficient body to hold bucket bolts.

MINIMUM NUMBER OF PLIES

An elevator belt must have enough body to back up the buckets, to hold the bolts and to resist the breaking effect of lumps of material caught between the boot pulley and the belt. Table 4 shows the minimum number of plies permissible for various widths.

TABLE 4—MINIMUM PLIES OF ELEVATOR BELTS

Width of belt, in.	For heavy material	For grain or other light, non-abrasive material
10 to 12	5-ply	4-ply
14 to 18	6-ply	5-ply
20 to 30	7-ply	6-ply
32 and over	8-ply	7-ply

MAXIMUM NUMBER OF PLIES

Because of the stiffening of the belt due to the buckets, however, it is necessary to avoid using too many plies in proportion to pulley diameters. Table 5 shows the maximum number of plies for various diameters of head pulley.

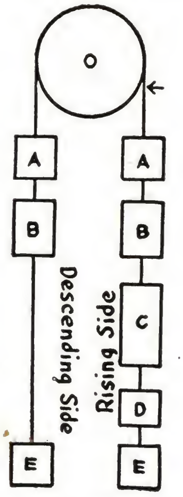
TABLE 5—MAXIMUM PLIES OF ELEVATOR BELTS

Diameter of head pulley, in.	Number of plies
24	5-ply
30	6-ply
36	7-ply
42	8-ply
48	9-ply
54	10-ply
60	12-ply
72	14-ply

In estimating resistance to tension calculate according to the following:

Grade	Working strength per inch per ply
Morecon	27½ lbs.
Akron	30 lbs.
New Mining	30 lbs.
Legrain 32-oz.	27½ lbs.
Legrain 28-oz.	25 lbs.

TENSION IN ELEVATOR BELTS



The adjoining cut graphically represents the various component parts of the tension in elevator belts. It reaches its maximum on the rising side at point indicated by arrow and is computed by adding together the following:

A. **Weight of One-Half the Belt**—Weight per foot equals approximately width by number of plies by .04 lbs.

B. **Weight of One-Half the Buckets.**

C. **Maximum Weight of Material Going Up**—Multiply number of buckets on rising side by contents per bucket in cubic feet by weight of material per cubic foot.

D. **Friction in Boot and Bearings**—For scoop feed, friction is approximately equivalent to the weight of material carried on 25 to 50 ft. of belt, depending on conditions in the boot. Resistance is less when material is fine and increases proportionately with the boot-pulley diameter. When fly-feed is used, reduce amount one-half.

E. **Initial Tension**—Two to five pounds per inch per ply. Not necessary unless belt is tightened by take-up device.

Thickness of Covers—For light, dry, non-abrasive materials such as grain, elevator belts are made without rubber cover. For moderately abrasive materials, covers may be $\frac{1}{32}$ or $\frac{1}{16}$ in. For extremely abrasive or abusive service covers should be over $\frac{1}{16}$ in. In heavy mining service covers as thick as ¼ in. are employed. It is usually more economical to have a thicker cover on the pulley side.

Width—Good practice calls for a belt 2 in. wider than the buckets.

Length of Belt—Add diameters in inches of head and boot pulleys and multiply by .131. Add to this product twice the distance between centers. The result is the length in feet.

Horsepower—Horsepower is equal to the sum of components C and D in the adjoining diagram, in pounds, multiplied by the speed of the belt and then divided by 33,000.

Capacity—Tons per hour equals average weight in pounds carried per bucket times the number of buckets passing over the head pulley per hour, divided by 2,000.

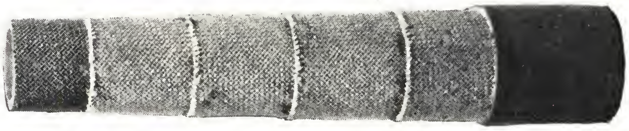
For additional information ask for Goodrich manual of Conveyor and Elevator Belt Practice.

FACTS ABOUT HOSE

DEFINITION OF TERMS

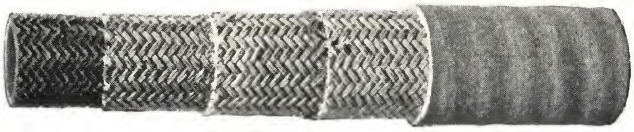
WRAPPED CONSTRUCTION HOSE

Woven cotton duck, impregnated with rubber, is wrapped around the tube in a spiral cross section. Weight of duck ranges from 5 oz. per square yard to 32 oz. per square yard. Number of wrappings determines number of plies.



BRAIDED CONSTRUCTION HOSE

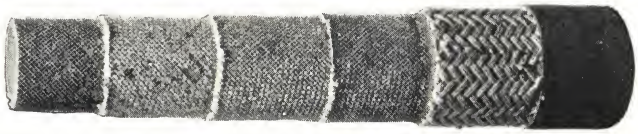
Instead of woven duck the hose is reinforced by strands of yarn braided over the tube as ribbons are braided on a maypole.



Affords superior flexibility and resistance to kinking.

COMBINATION CONSTRUCTION HOSE

Two or more plies of wrapped duck, outside of which is applied one ply of braided yarn. Combines internal strength and rigidity of fabric with flexibility of braid. Does not come unwrapped when rubber cover is worn out.



COVER

Outside rubber layer, applied over the cotton reinforcement.

TUBE

The rubber lining—usually formed by extrusion from a "tubing" machine—through a die exactly controlling the I. D. and O. D. At this stage the rubber is like dough.

MANDREL CURE

Hose is wrapped or braided on 50-ft. steel poles or "mandrels" and then cured (or vulcanized) in steam-filled heaters. Mandrel cure insures accuracy in inside diameter, a smooth surface tube, and high burst resistance. Cannot be used for long lengths. Mandrel cured hose is identified by the cloth impression on the surface.

LONG LENGTH CURE

Hose is built in continuous 500-ft. lengths, covered temporarily with a lead casing and then coiled in the curing heaters. Inside of hose is filled with hot water at high pressure. Insures a more compact wall. Identified by its molded surface, usually smooth, sometimes corrugated. Not adapted to sizes over 1½ in. I. D.

COTTON RUBBER-LINED HOSE

Cotton jacket is woven on a circular loom. Sometimes made with two cotton jackets. Rubber lining is inserted. As a rule there is no rubber cover. Adaptable for fire hose since it affords light weight, compact reeling and high resistance to burst. Maximum length 50 ft. Not suitable for hose exposed to severe external wear or corrosion.

WORKING PRESSURES

Experience has proved that the recommended maximum working pressure of hose should not exceed one-fourth of its ultimate bursting pressure—a safety factor of four to one. Working pressures may momentarily exceed the recommended maximum, but if the excess pressure is continuous the hose structure is strained and rendered more susceptible to injury and deterioration.

TEST PRESSURES

In some cases hose is guaranteed to meet certain initial "Test Pressures." This is usually about one-half the ultimate bursting pressure or twice the recommended working pressure.

FRICTION LOSS IN RUBBER HOSE

Table No. 6 is based on frictional resistance to flow of water in straight lines of hose with open end. A margin should be allowed for short bends.

Couplings—For each set of shank couplings or nipples, increase loss 5%. No allowance need be made for expansion ring or full-flow couplings.

Liquids—The table is calculated for water. Pressures should be increased proportionately for liquids of higher viscosity or higher specific gravity. If necessary to figure on a close margin it is desirable to ascertain the exact inside diameter of the hose since the latter is subject to slight variation from the nominal inside diameter.

Generally speaking, the friction loss in rubber hose is less than in iron pipe.

TABLE NO. 6—LOSS IN POUNDS PRESSURE PER 100 FEET OF HOSE

Actual inside diameter, in.

U. S. gal. per min. water	½	⅝	¾	1	1¼	1½	2	2½	3	4	5
1½	2.8	0.7	0.5								
2½	7.6	2.1	1.1								
5	28.5	9.6	4.0	1.1	0.4	0.2					
10	101.0	33.8	14.0	4.1	1.2	0.5	0.2				
15	......	70.0	30.0	8.9	2.5	1.1	0.4	0.1			
20	......	112.0	53.0	14.0	4.3	1.8	0.7	0.2			
25	......	......	79.0	22.0	6.5	2.9	1.0	0.3			
30	......	......	112.0	31.0	9.2	4.0	1.4	0.4	0.1		
35	......	......	147.0	41.0	12.0	5.3	1.8	0.5	0.2		
40	......	......	......	53.0	15.0	6.7	2.4	0.6	0.3		
45	......	......	......	66.0	19.0	8.4	3.0	0.8	0.4		
50	......	......	......	80.0	24.0	10.0	3.6	1.0	0.5		
60	......	......	......	101.0	35.0	14.0	5.1	1.4	0.6		
70	......	......	......	......	45.0	19.0	6.6	1.8	0.8		
80	......	......	......	......	58.0	24.0	8.6	2.3	1.1		
90	......	......	......	......	71.0	30.0	11.0	3.0	1.4	0.3	
100	......	......	......	......	88.0	37.0	12.5	3.5	1.7	0.4	0.1
125	......	......	......	......	132.0	55.0	20.0	5.3	2.5	0.6	0.2
150	......	......	......	......	183.0	78.0	27.0	7.5	3.5	0.7	0.3
175	......	......	......	......	......	100.0	37.0	10.0	4.6	1.1	0.4
200	......	......	......	......	......	133.0	46.0	13.0	5.9	1.4	0.5
250	......	......	......	......	......	......	70.0	19.0	9.1	2.1	0.7
300	......	......	......	......	......	......	95.0	27.0	12.0	2.9	1.0
350	......	......	......	......	......	......	126.0	36.0	17.0	4.0	1.3
400	......	......	......	......	......	......	......	46.0	21.0	5.1	1.7
450	......	......	......	......	......	......	......	57.0	26.0	6.3	2.1
500	......	......	......	......	......	......	......	70.0	32.0	7.4	2.6
1000	......	......	......	......	......	......	......	......	116.0	27.0	9.6
2000	......	......	......	......	......	......	......	......	......	100.0	32.0

EXAMPLE—What water pressure is required at intake end of a 200-ft. line of 1½-in. hose joined in 50-ft. lengths with shank couplings? A delivery of 50 gals. of water per minute is desired. Consulting the table we find the hose requires 10 lbs. per 100 ft. or 20 lbs. for the 200 ft. Adding 5% for each of four sets of couplings, we have a total of 24 lbs.

GOODRICH AIR HOSE

For Couplings see Page 19

HIGH GRADE AIR HOSE FOR GENERAL SERVICE: TYPE 50

Largest selling air hose, available in all local stocks. Red cover, braided construction, long length cure. A hose of high quality, yet light enough to insure easy handling and flexibility. Extremely tough cover, oil-proof tube.

Service Recommendations—

Two-braid weight—shop tools, tie tamping, light portable compressor service, tire inflation (¼ in. and ⅜ in.).

Three-braid weight, for heavy shop tools, average and heavy portable compressor service, tie tamping, air hoists, metal mining, average quarry service. Can be supplied in 50-ft. lengths or in continuous lengths up to 500 ft.

Size, in.	No. braids	Working pressure, lbs.	List price per foot, uncoupled
¼	2	250	$0.225
⅜	2	200	.27
½	2	200	.35
½	3	250	.40
⅝	3	225	.45
¾	2	150	.40
¾	3	200	.49
1	3	150	.54

EXTRA QUALITY HOSE FOR MINING SERVICE: COMMANDER

Grey cover, braided construction, mandrel cured, maximum length 50 ft. An extra heavy hose, stronger than necessary for ordinary pneumatic tool service, but adapted to extreme conditions in mines and quarries, extra heavy shop tools, heavy air hoists, large air-operated machines. The two-braid weight is suitable for general service. Three-braid weight is recommended for hardest conditions.

Size, in.	No. braids	Working pressure, lbs.	List price per foot, uncoupled
½	2	225	$0.60
½	3	275	.68
¾	2	175	.78
¾	3	225	.94
1	3	175	1.16
1¼	3	150	1.44
1½	3	150	1.94

LIGHT WEIGHT PNEUMATIC TOOL HOSE: AKRON

Black cover, wrapped construction, long length cure. Supplied in continuous lengths up to 500 ft. A compact, strong hose, yet light in weight and easily handled. For light shop tools, air-operated industrial machines, blow guns, air lifts.

Size, in.	No. plies	Working pressure, lbs.	List price per foot, uncoupled
⅜	6	125	$0.24
½	7	125	.33
¾	7	125	.44

WIRE WINDING

Wire winding is becoming obsolete because of the tough rubber covers on modern air hose. Where desired, however, half round winding can be furnished to order at extra prices as below:

Size of hose, in.	List price per foot	Size of hose, in.	List price per foot
⅜	$0.10	1	$0.14
½	.11	1¼	.17
⅝	.12	1½	.20
¾	.13	2	.25

HEAVY DUTY WRAPPED HOSE FOR MINING SERVICE: TYPE 88

Grey cover, wrapped construction, mandrel cured. An extra heavy hose with thick tough cover. Recommended for same service as Commander. It meets the requirements of operators who prefer a wrapped construction hose. Maximum length—50 ft.

Size, in.	No. of plies	Working pressure, lbs.	List price per foot, uncoupled
½	4	225	$0.48
¾	4	200	.67
1	5	175	.87
1¼	5	150	1.26
1½	6	150	1.76
2	6	150	2.24

CLOTH INSERTED HOSE

Made like wrapped hose in small diameters with an insertion of cotton sheeting to impart strength to resist pressures.

The ¼ and 5/16-in. sizes are made with red cover, designated as Type 22. Especially adapted to air lines on paint spraying outfits.

Size, in.	No. plies	O.D., in.	Color	Grade	Maximum length, ft.	List price per 100 feet
3/16	3	7/16	Black	Heavy C.I. hose	12	$11.85
3/16	5	7/16	Black	Standard C.I. hose	12	12.70
¼	3	½	Red	Type 22	50	18.70
5/16	3	35/64	Red	Type 22	50	19.20

BRAIDED COVER HOSE

Black rubber tubing covered with a layer of black and yellow cotton braids. Furnished in reels 500 ft. long. Used for air or liquids under pressure. Will not stand abrasive wear.

Size, in.	O.D., in.	Working pressure, lbs.	List price per 100 feet
⅛	19/64	200	$ 6.80
3/16	23/64	175	8.60
¼	27/64	150	10.30
5/16	31/64	125	12.50
⅜	35/64	100	

GOODRICH WATER HOSE

For Couplings see Page 19

STANDARD QUALITY FOR GENERAL SERVICE: JUPITER

Braided construction, long length cure. Meets 75% of water hose requirements in industrial plants and yards for wash-up service. 1-in., 1¼-in. and 1½-in. sizes are made in both two-braid and three-braid weights, the two-braid being heavy enough for moderate service.

Size, in.	No. of braids	Working pressure, lbs.	Max. length, ft.	List price per ft., uncoupled
¾	3	150	500	$0.40
1	2	125	500	.40
1	3	150	500	.50
1¼	2	100	250	.50
1¼	3	125	250	.62
1½	2	100	250	.60
1½	3	125	250	.75
*2	3	125	50	1.00

*(Mandrel cured).

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HIGH PRESSURE HOSE FOR SEVERE SERVICE: HIGH DUTY

Braided construction. Smaller sizes long length cure; 1½-in. and 2-in. sizes mandrel cured. Cords are extra heavy, affording resistance to high pressure. Cover is of thick, black, extremely tough, wear-resisting compound. Because of its strong construction High Duty is not so flexible as Jupiter, but adapted to severe service under high pressures. Cost averages approximately 25 to 35% above Jupiter.

Size, in.	No. of braids	Working pressure, lbs.	Max. length, ft.	List price per ft., uncoupled
¾	2	200	500	$0.30
1	2	200	500	.40
1¼	3	200	250	.62
1½	3	200	50	.75
2	3	200	50	1.00

For sizes over 2½ in. see Commander Fire Hose, page 14.

GARDEN HOSE

MAXECON

Braided construction, long length cure, black corrugated cover. Maximum length 500 ft. High quality lawn hose. Also economical for average contractors and industrial service.

Size, in.	No. of braids	Working pressure, lbs.	List price 50 ft., coupled	Per ft., uncoupled
½	2	125	$10.50	$0.21
⅝	2	125	11.00	.22
¾	2	125	12.00	.24

COMBINATION CONSTRUCTION FOR SEVERE SERVICE: BROWN COMBINATION

Combination construction mandrel cured, 50-ft. lengths. Older type hose than High Duty with a very successful record for service involving high pressure or severe wear. Used in paper mills, mines, greenhouses and in the larger sizes for concrete paving machines. Cost averages approximately 30% above High Duty.

Size, in.	No. of plies	Working pressure, lbs.	List price per ft., uncoupled
½	3	200	$0.25
¾	3	200	.30
1	3	150	.40
1	4	200	.50
1¼	3	125	.50
1¼	4	175	.62
1½	4	175	.75
1½	5	200	.93
2	4	150	1.00
2	5	200	1.25
2½	5	200	1.56

SUPER QUALITY: DE LUXE

Braided construction, long length cure, maximum length 500 ft. Extra heavy couplings. Green ribbed cover. For contractors, greenhouses, golf courses, large estates and other severe service.

Size, in.	Working pressure, lbs.	List prices	
		50-ft. lengths, coupled	Per ft., uncoupled
⅝	150	$13.50	$0.26
¾	150	15.00	.29
1	150	20.00	.38

HOSE WITH BUILT-IN SPRAYS

Multispray Outfits—Consist of 50 ft. Maxecon hose, coupled, ⅝ in. size, with four built-in spray heads, detachable supports and end cap. Packed in a box. Ideal method of spraying large area quickly. Four sprays use no more water than one spray nozzle.

List price per outfit, $15.00.

WRAPPED WATER HOSE

Wrapped construction being an older type of hose is still preferred by many users. Goodrich stocks two grades. Maximum length, 50 ft.

CASCADE

High quality tough red cover.

Size, in.	No. of plies	Working pressure, lbs.	List price per ft.
1	4	125	$0.50
1¼	4	125	.62
1½	4	100	.75

DELUGE

Black cover, dependable quality. Cost averages approximately 40% below Cascade.

Size, in.	No. of plies	Working pressure, lbs.	List price per ft.
1	3	100	$0.40
1	4	125	.50
1¼	4	125	.62
1½	4	100	.75
2	4	75	1.00
2	5	100	1.25

MILL FIRE PROTECTION HOSE

50-ft. lengths

For Couplings see page 19

GOODRICH FLAT CURE

All Goodrich Cotton Rubber Lined Mill Fire Hose 1½ in. and larger is made flat, as shown below. Flat cure hose becomes round like ordinary hose when filled with water under 5 lb. pressure, and carries the same amount of water.

It coils more compactly and lasts years longer, because when coiled the rubber is in its natural position and not under tension.

GOODRICH HYDROSEAL TREATMENT

Mainstay and Summit grades can be furnished with the new Goodrich Hydroseal treatment, by which every cotton strand in both single and double jacket hose is completely impregnated with the wax and gum mixture. This affords high resistance to water absorption, prevents hose from freezing tight to the ground, and gives maximum protection against mildew, although it does not prevent the necessity of drying the hose after using.

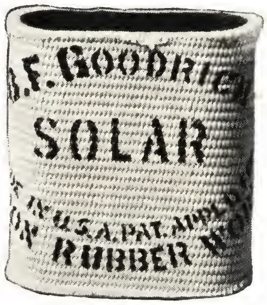
HIGHEST QUALITY SINGLE JACKET: MAINSTAY

DeLuxe grade for long life and greatest ultimate economy. Guaranteed for 300 lbs. test pressure on delivery. Made in 1¼, 1½, 2, 2½, 3 and 4-in. sizes.

MEDIUM QUALITY SINGLE JACKET: METEOR

Cost approximately 20% below Mainstay. Guaranteed for 250 lbs. test pressure on delivery. Made in 1, 1¼, 1½, 2 and 2½-in. sizes.

LIGHT WEIGHT SINGLE JACKET: SOLAR



An inexpensive but dependable brand. Guaranteed to meet initial test pressure of 200 lbs. Cost is approximately 30% less than Mainstay. Made in 1, 1¼, 1½, 2 and 2½-in. sizes.

UNDERWRITERS' SINGLE JACKET: SIGNAL

Meets specification tests of Chicago Underwriters' Laboratory, with Underwriters' label. Cost is approximately 10% more than Mainstay. Made in 1½, 2 and 2½-in. sizes.

UNDERWRITERS' SINGLE JACKET: ALARM

To specifications of Associated Factory Mutual Laboratory. Cost approximately 10% more than Mainstay. Made in 2½-in. size.

DOUBLE JACKET: SUMMIT

For plants maintaining large fire departments where hose is frequently used. The extra jacket affords additional resistance to wear and is adaptable to use on ladders since the twist is much lower than in single jacket hose. Guaranteed to meet initial test pressure of 350 lbs. Cost with heavy municipal type couplings is approximately 15% higher than Mainstay. List prices, uncoupled:

1½ in.	$0.68 per foot
2 in.	.85 per foot
2½ in.	.98 per foot

STANDARD LIST PRICES COTTON, RUBBER LINED HOSE, SINGLE JACKET, UNCOUPLED

Size, in.	Per foot
1	$0.40
1¼	.45
1½	.50
2	.65
2½	.80

RUBBER COVERED FOR SEVERE ABRASION AND CORROSIVE FUMES:

WHITE ANCHOR

Wrapped type hose with white rubber cover which protects hose from wear and acid fumes. Especially recommended for oil refineries and chemical plants. Guaranteed to meet initial test pressure of 350 lbs. Sold at net prices, including heavy type couplings. Cost is approximately 60% more than Mainstay.

RUBBER COVERED FOR ABRASION AND CORROSIVE FUMES:

COMMANDER

Commander hose is made like Mainstay cotton rubber lined hose except that a tough rubber cover is vulcanized on the outside to protect the cotton. Guaranteed for initial test pressure of 300 lbs. Cost is approximately 45% higher than Mainstay. For fire protection where exposed to excessive moisture, abrasion or corrosive fumes. Also for general water discharge service when a large diameter hose is wanted.

Size, in.	Per foot, uncoupled
1½	$1.20
2	1.48
2½	1.68
3	2.02
4	2.68

GOODRICH STEAM HOSE

For Couplings see page 19

In the tables below, "Low" refers to temperatures corresponding to saturated steam below 50 or 60 lb. per square inch pressure, "Medium" refers to from 50 to 80 lb. and "High" to pressures over 80 lb. Maximum length of all constructions, 50 ft. However, 25 or 12½-ft. lengths may be furnished from stock.

HIGH QUALITY FOR SEVERE SERVICE:

GOODRICH BRAND

Wrapped construction, mandrel cured. Maximum length 50 ft. For pile drivers, coal thawing, oil refineries, contractors and general service.

This is the most widely stocked grade of steam hose in the Goodrich line and the highest quality of cotton fabric reinforced steam hose it is possible to obtain. Effective for superheated as well as saturated steam.

Sizes, in.	No. of plies	Temperatures	List prices per foot, uncoupled
½	4	Low and Med.	$0.56
½	5	High	.70
½	6	High	.84
¾	4	Low	.71
¾	5	Medium	.87
¾	6	High	1.05
¾	8	High	1.41
1	4	Low	.87
1	5	Medium	1.07
1	6	High	1.28
1	8	High	1.70
1¼	5	Low and Med.	1.30
1¼	6	High	1.56
1½	5	Low and Med.	1.56
1½	6	High	1.87
1½	8	High	2.50
2	6	Low and Med.	2.49
2	8	High	3.32

FOR SEVERE EXTERNAL WEAR:

TYPE 55 STEAM AND WASHOUT

Combination construction, mandrel cured, maximum length 50 ft. A good general utility hose not only for steam and hot water but car washing service, spray hose, and a clean-up hose in creameries, packing houses and other similar types of service. The outer ply is a layer of herringbone braid. This serves to hold the cover in place where the hose is subjected to severe wear.

Cost is approximately 10% below Goodrich.

Sizes, in.	No. of plies	Temperatures	List prices per foot
½	4	Medium	$0.56
¾	4	Medium	.71
1	4	Low	.87
1	5	Medium	1.07
1¼	5	Medium	1.30
1½	5	Low	1.56
1½	6	Medium	1.87
2	5	Low	2.07
2	6	Medium	2.49

FOR LOW PRESSURES:

FALCON

Wrapped construction, mandrel cured, maximum length 50 ft. Durable hose for low pressure steam and hot water service. Cost is approximately 20% lower than Goodrich.

Sizes, in.	No. of plies	Temperatures	List prices per foot
½	4	*	$0.56
½	5	Low	.70
¾	4	*	.71
¾	5	Low	.87
1	4	*	.87
1	5	Low	1.07
1¼	5	*	1.30
1¼	6	Low	1.56
1½	5	*	1.56
1½	6	Low	1.87
2	6	*	2.49
2	8	Low	3.32

*Hot water.

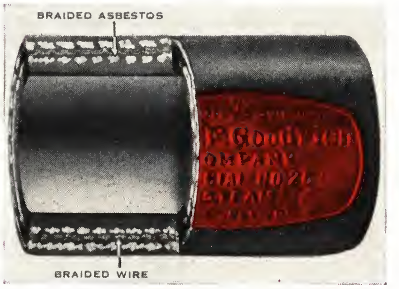
WIRE WINDING

Half-round wire winding with ⅝ in. spacing sometimes increases steam hose life. For prices see page 12.

SPECIAL QUALITY FOR HIGH PRESSURE:

TYPE 26

Asbestos and wire insertion. Braided construction, mandrel cured. A new type of steam hose containing no cotton, the braid consisting of asbestos and wire. For extreme service. Recommended for steam pressures up to 200 lb.



Sizes, in.	List price per foot, uncoupled
½	$1.14
¾	1.58
1	2.42
1¼	3.04
1½	3.40

ORCHARD SPRAY HOSE

Goodrich Orchard Spray Hose is built for working pressures up to 500 lbs., and with oil resisting tube that withstands all spraying solutions and emulsions.

FOR HIGH PRESSURE SPRAYING:

HIGH DUTY

Strong braided plies. Tough durable cover.

The ideal hose for high pressure spraying.

FOR GENERAL SERVICE: TYPE 88

Long length wrapped fabric construction, with high bursting strength. An exceptionally strong and compact hose.

HIGH DUTY			TYPE 88		
Sizes, in.	No. of braids	List prices per 100 ft., uncoupled	Sizes, in.	No. of plies	List prices per 100 ft., uncoupled
⅜	3	$27.30	⅜	5	$27.30
½	3	33.40	½	6	30.00
¾	3	40.00	½	7	32.70
			¾	7	41.00

GOODRICH SUCTION HOSE

HIGH GRADE FOR WATER:

TYPE 44

Reinforced with extra heavy flat wire inside the tube. This construction is commonly known as "Rough Bore." Superior in resistance to crushing. For pumping out excavations and other general service. Orders must specify whether hose is to be furnished with straight ends for couplings or enlarged ends for nipples. Maximum length 50 ft. Commonly used in 10, 15 and 20-ft. lengths.

I.D., in.	List price per foot, uncoupled
2	$1.80
2½	2.14
3	2.50
4	2.82

INEXPENSIVE GRADE FOR WATER:

TYPE 33

For contractors and similar service. "Rough Bore" construction. Made in same lengths as Type 44. Superior resistance to crushing. Orders must specify whether hose is to be furnished with straight ends for couplings or enlarged ends for nipples.

I.D., in.	List price per foot, uncoupled
2	$1.42
2½	1.82
3	2.08
4	2.62

HEAVY DUTY FOR VACUUM CLEANING:

GOODRICH

For air suction only. Heavy round wire insertion, rubber covered.

I.D., in.	List price per foot, uncoupled
¾	$1.14
1	1.25
1¼	1.34
1½	1.46
1¾	1.71
2	1.94
2½	2.32

FOR GRITTY OR CORROSIVE MATERIALS:

CASCADE

This construction is described as "Smooth Bore" since it is reinforced with round wire built into the wall, so that the materials contact only with rubber, insuring longer wear under abrasion or corrosive conditions. Cascade is a high grade, sturdy hose for general service. Maximum length 50 ft. Usually furnished in 10, 15 and 20-ft. lengths. Orders must specify whether hose is to be furnished with straight ends for couplings or enlarged ends for nipples.

I.D., in.	List price per foot, uncoupled
2	$1.79
2½	2.44
3	3.28
4	4.52
5	6.10
6	7.32

HARD RUBBER SUCTION HOSE FOR LIGHT SERVICE:

SUMMIT

Contains no wire, but rubber is cured to a sufficient firmness to resist low vacuums. Made only with straight ends for couplings. Wrapped construction, mandrel cured, maximum length 50 ft.

I.D., in.	List price per foot, uncoupled
¾	$0.41
1	.50
1¼	.575
1½	.68
2	.89

ACID SUCTION HOSE

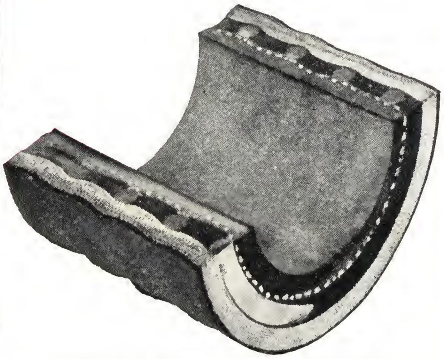
Same quality material as Goodrich Acid Hose (page 17) except for insertion of round coppered steel wire. Suitable for service up to full vacuum. Tube is 3/16 in. thick, anchored to carcass of hose by cord breaker fabric.

Size, in.	List price per foot
1½	$2.26
2	3.08
2½	3.54
3	4.20

HEAVY DUTY FOR ABRASIVE CONDITIONS:

AKRON

Extra heavy, smooth bore hose for flexible connections on suction dredges and similar severe service in large diameters. Number of plies for each size is less than in other manufacturers' hose because of the heavy fabric used. Extra heavy construction contains an additional wire reinforcement. Made to order in any length 3 ft. to 50 ft., with enlarged ends for nipples.



Details of Construction of Akron Hose

(1) Tube of Goodrich Armorite, toughest known rubber compound.
(2) Cord network insuring adhesion of tube under highest vacuum.
(3) Heavy spring steel wire.
(4) Extra heavy cotton duck reinforced with additional wire in "extra heavy" construction.
(5) Thick, tough rubber cover.

I.D., in.	List price per foot, uncoupled	
	Standard construction, ¼-in. tube	Extra heavy construction, ½-in. tube
4	$12.36	
6	19.38	
8	26.64	
10	32.60	
12	40.70	$42.20
14	45.80	52.40
16	56.40	58.44
	75.70	70.20

MOLASSES SUCTION HOSE:

TYPE 100

Extra heavy rough bore hose for either suction or discharge of molasses or other heavy liquids.

Size, in.	List price per foot
4	$ 9.56
6	14.46
8	17.78

AGRICULTURAL SUCTION HOSE

Lighter than Type 33. Rubber covered, rough bore.

Size, in.	List price per foot
1½	$0.89
2	1.00

FOR OXY-ACETYLENE WELDING: GOODRICH

Braided construction, long length cure, furnished in any length up to 500 ft. Corrugated cover. Red cover hose is used for acetylene line and green cover hose is used for oxygen line.

I.D., in.	List price per foot, uncoupled
3/16 1 br.	$0.24
¼ 2 br.	.33
¼ 3 br.	.40
5/16 2 br.	.37
⅜ 2 br.	.40
⅜ 3 br.	.47

HEAT RESISTING WELDING HOSE:

FIRE KING

For oxy-acetylene welding, also suitable for air or water. Rubber specially compounded for heat resistance. Outer ply of braided asbestos cord. Economical for use where molten metal or flame is liable to damage hose. Red or green colors. Maximum length 50 ft.

Size, in.	O.D., in.	List price per foot, uncoupled
¼	11/16	$0.43
5/16	¾	.465
⅜	13/16	.50

FOR SAND BLAST: GOODRICH

Wrapped construction, mandrel cured. Maximum length 50 ft. Tube is ¼ in. thick of floating rubber stock. Construction resists collection of static. All sizes are 4-ply.

I.D., in.	List price per foot, uncoupled
¾	$1.11
1	1.22
1¼	1.43
1½	1.64
2	2.04
2½	2.50
3	3.10

FOR ACIDS: GOODRICH

Wrapped construction, mandrel cured. Maximum length 50 ft. For discharge lines handling acids and other corrosives. Tube is 3/16 in. thick. All sizes are 4-ply. See page 16 for Acid Suction Hose.

I.D., in.	List price per foot, uncoupled
½	$0.67
¾	.80
1	.96
1¼	1.20
1½	1.36
2	1.78
2½	2.18
3	2.70

FOR PAINT SPRAY: MAINSTAY

Braided construction, long length cure. Maximum length 500 ft. Tube and cover of special compound with effective resistance to turpentine and other paint solvents.

I.D., in.	List price per foot, uncoupled
¼ 1 br.	$0.14½
⅜ 2 br.	.21½
½ 2 br.	.26½

FOR SAND AND CEMENT DISCHARGE

Wrapped construction, mandrel cured. Tube is Goodrich Armorite, the toughest known rubber, ¼ in. thick in sizes up to 4 in., and ½ in. thick in larger sizes. An insertion of wire imparts strength equivalent to many plies of fabric. Enlarged ends will be furnished unless otherwise specified.

I.D., in.	List price per foot, uncoupled
2½	$ 5.64
3	6.32
4	7.76
5	13.36
6	15.72
8	21.60
10	29.78
12	39.30

FOR CEMENT GROUTING

Wrapped construction, mandrel cured, maximum length 50 ft. Similar in construction to sand and cement discharge hose except it is reinforced with two additional plies, without wire insertion. Designed for high pressures. Enlarged ends will be furnished unless otherwise specified.

I.D., in.	List price per foot, uncoupled
2 6 ply	$5.88

FOR BEVERAGES: BOCK BREWERS' HOSE

Wrapped construction, mandrel cured, maximum length 50 ft. A super-quality hose for liquids hot or cold, where a high standard of sanitation is required. Well known to the brewery trade in former years. Will not impart odor, taste nor poisonous taint. Cream white cover. Cost is approximately 10% more than Goodrich brand Steam Hose.

TYPE 77

For vinegar, cider or fruit juices. Similar in construction and quality to Bock Brewers' Hose.

BOCK BREWERS' AND TYPE 77 HOSE

I.D., in.	Working pressure, lbs.	List price per foot, uncoupled
¾ 4 ply	175	$0.71
1 4 ply	150	.87
1 5 ply	175	1.07
1¼ 4 ply	125	1.04
1¼ 5 ply	150	1.30
1½ 4 ply	125	1.25
1½ 5 ply	150	1.56
2 4 ply	100	1.66
2 5 ply	125	2.07

TYPE 23

White, non-toxic inner tube. Tough red cover, insuring flexibility and durability. 50-ft. lengths. Especially for dispensing beverages.

I.D., in.	O.D., in.	Working pressure, lbs.	List price per 50-ft. length uncoupled
5/16 3 ply	9/16	150	$10.50
⅜ 3 ply	21/32	150	11.50
½ 3 ply	25/32	150	13.50
½ 5 ply	27/32	250	15.50

FOR CREAMERIES: COMMANDER

Combination construction, mandrel cured, maximum length 50 ft. Tough, cream white cover developed to resist wear and action of animal fats. For wash-up service, conducting steam and hot water. 35 and 50-ft. lengths can be furnished when desired, with built-on soft rubber nozzles.

I.D., in.	List price per foot, uncoupled	List price rubber nozzles
¾	$0.655	$3.70
1	.795	3.92

OIL AND GASOLINE HOSE

FILLING STATION HOSE: GOODRICH

Metal lined gasoline hose, woven cotton jacket, Celinol rubber lining with heavy non-crushing interlocking metal tube. Meets Underwriters' tests. Maximum length 60 ft.

Size, in.	List prices	
	*10-ft. lengths, coupled	Each additional foot
¾	$5.44	$0.384
1	6.42	.444
1¼	8.14	.544

*Price includes protector rings.

GASOLINE TANK TRUCK HOSE

Construction similar to filling station hose, except for the addition of special wire filler in the jacket, which greatly increases flexibility and strength.

Size, in.	List prices	
	10-ft. lengths, coupled	Each additional foot
1½	$12.48	$0.816
2	16.80	1.09

GASOLINE TANK CAR UNLOADING HOSE

Same construction as tank truck hose, except heavier.

Size, in.	List prices	
	10-ft. lengths, coupled	Each additional foot
2½	$32.10	$1.85
3	39.88	2.22

RUBBER COVERED PUMP HOSE

The same high quality metal lining and Celinol tube as in our Cotton Covered Gasoline Hose, over which is a ply of strong cords and a specially developed tough black rubber cover, that will not rub off black. This hose remains flexible in wet, cold weather. The specially designed Permalock couplings are guaranteed leak proof. Ideal for airports.

Size, in.	List prices	
	10-ft. lengths, coupled	Each additional foot
¾	$5.92	$0.47
1	6.92	.545
1¼	8.86	.67

OIL CARGO HOSE

Goodrich makes various types of heavy duty hose for suction and discharge service on marine docks—also for submarine service. This type of hose is also useful for unloading fuel oil from railroad tank cars into storage tanks.

HOSE FOR FUEL OIL:

GOODRICH DISTILLATE AND FUEL OIL HOSE

Braided construction. Long length cure. For fuel oil tank trucks and similar service. All sizes are three-braid construction.

Size, in.	Maximum length, ft.	List price per foot, uncoupled
1	500	$0.76
1¼	250	.845
1½	250	1.00
2	50	1.56

OTHER TYPES OF HOSE

Goodrich also makes the following types of hose not listed in this catalog:

Air Brake
Car Heating
Chemical Extinguisher
Coke
Drillers'
Engine Cleaning
Cement Gun
Hydraulic Brake
Municipal Fire
Radiator
Grease
Steam Ironing
Tanners'
Tender

All types of hose to A.R.A. specifications.

NOZZLES

RUBBER NOZZLES

Tapered rubber nozzles built on the hose. Useful on water, steam, creamery and other types of hose where there is danger of breakage of fragile equipment from metal nozzles. Can be applied only on mandrel cured hose, not on long length cure.

Size of hose, in.	Length of nozzle, in.	List price, each
½	12	$3.60
¾	12	3.70
1	12	3.92
1¼	12	4.32
1½	18	5.32
2	18	6.24
2½	18	7.62
3	18	9.82

BRASS NOZZLES

Furnished in either screw tip or plain. Iron pipe or standard hose thread. For special thread add 10% to prices.

Garden hose nozzles, adjustable spray—brass, list price $0.90 each.

UNDERWRITERS' PLAY PIPES

Nozzles conforming to specifications of Underwriters' Laboratories and Factory Mutual Laboratory, size 2½x30 in. List price each, $14.66.

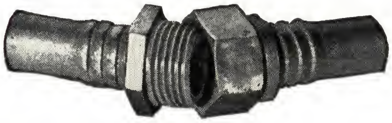
• • • •

Thread size, in.	Length, in.	Screw tip		Plain tip	
		Discharge opening, in.	List price	Discharge opening, in.	List price
¾	6	¼	$0.60	¼	$0.60
1	8	¼	.90	5/16	.84
1¼	12	⅜	1.75	⅜	1.60
1½	12	½	2.10	½	2.00
2	12	⅝	3.30	9/16	3.00
2½	20	1	8.40	1	7.90
2½	24	1	8.75	. . .	. . . .
2½	30	1	12.50	. . .	. . . .

HOSE FITTINGS

COMMON COUPLINGS

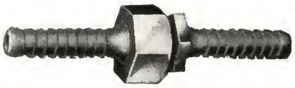
Short shank brass couplings for water pressures up to 50 lbs., also suction service. Size 1 in. and under have gripping flutes on female swivel, but no lugs. Heavy brass ferrule applied outside of hose. Sizes over 1 in. up to 2½ in. inclusive have lugs on female swivel only. Applied with one clamp at each end. Sizes 3 in. and over have lugs on both male and female swivel. Applied with one clamp at each end. Iron pipe thread. For special thread add 10% to price.



Size, in.	List price per set applied
½	$ 0.55
¾	.55
1	1.00
1¼	1.56
1½	1.78
2	3.24
2½	4.62
3	7.70
3½	13.44
4	15.90
5	24.20
6	43.80

LONG SHANK COUPLINGS

For air and steam pressures up to 50 lbs., water pressures up to 100 lbs. Attached to hose with two clamps at each end. Hexagonal nuts on both male and female swivel. Iron pipe thread. For special thread add 10% to price.

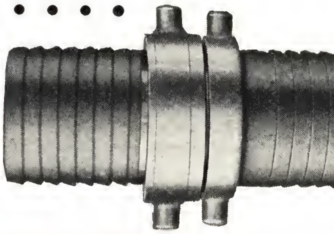


Size, in.	List price per set applied
¼	$ 1.40
⅜	1.40
½	1.56
¾	1.90
1	2.36
1¼	3.00
1½	3.62
2	4.64
2½	8.34
3	13.50
3½	19.74
4	26.00

SPECIAL SUCTION HOSE COUPLINGS • • • • •

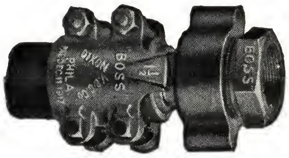
Similar to common couplings except that male swivels on both shanks are malleable iron instead of brass. Attached with one clamp at each end. Iron pipe thread only.

	List prices
3-in. lug on swivel only	$ 5.76 per set
3-in. lugs on both swivel and male part	6.52 per set
4-in. lugs on both swivel and male part	10.00 per set



HIGH PRESSURE COUPLINGS

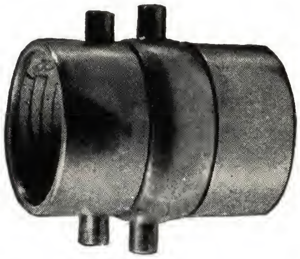
The only 100% safe coupling for water pressures over 100 lbs., and for air and steam above 50 lbs. pressure. Clamps are anchored to shank so that it is almost impossible to blow them off.



Size, in.	List price per end, female	List price per end, male
¼	$ 1.08	$ 0.62
⅜	1.32	.78
½	1.68	.96
¾	2.88	1.44
1	3.18	1.74
1¼	5.28	2.76
1½	5.52	3.36
2	8.70	4.92
2½	16.80	9.60
3	21.00	13.20
4	39.60	22.50

MILL FIRE HOSE COUPLINGS: TYPE 40

Single jacket mill hose. Brass expansion ring type. Regular commercial mill hose coupling.



List Prices Per Set Attached

Size, in.	Type 40
1	$2.00
1¼	2.12
1½	2.22
2	3.34
2½	4.44

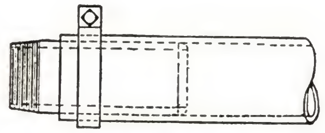
HEAVY FIRE HOSE COUPLINGS

Brass expansion ring type for double jacket hose, White Anchor or Commander rubber covered hose.

Type	Size, in.	List price per set attached
50	1½	$3.66
50	2	4.44
30	2½	6.66

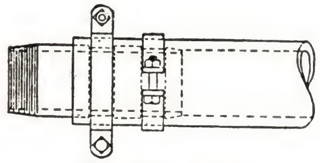
NIPPLES

For suction and other large diameter hose. Made from standard iron pipe. For use with flanges in clamping hose to pipe. Inside diameter of hose must be approximately same as outside diameter of standard pipe or else hose must have enlarged ends.



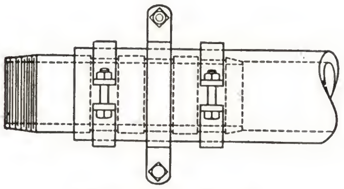
Single-clamp Nipple

Plain pipe without grooves. Iron pipe thread. For light suction or low discharge pressure. Can be attached with wire-winding instead of clamp, when specified.



Two-clamp Nipple

Nipples with two grooves. Iron pipe thread. For general suction service or discharge pressures up to 100 lbs. in sizes up to 2 in., and 50 lbs. in sizes over 2 in.



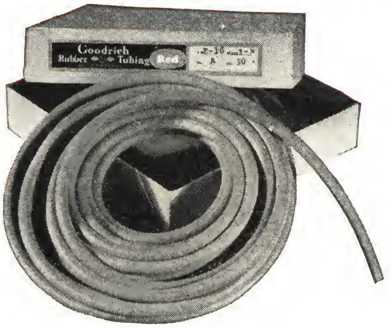
Three-clamp Nipple

Three grooves. For heavy suction hose service in sizes 4 in. and over, particularly for sand suction and discharge service.

Size, in.	Single-clamp type	Two-clamp type	Three-clamp type
½	$0.80	$ 1.00	
¾	.89	1.10	
1	1.12	1.30	
1¼	1.22	1.60	
1½	1.34	2.00	
2	1.60	2.66	
2½	2.12	3.34	
3	3.00	4.44	
3½	3.72	5.56	
4	4.44	7.20	$16.70
4½			17.60
5		11.12	19.04
6		15.00	20.00
7			22.90
8		20.34	24.46
10			36.68
12			54.46

ALL-RUBBER HOSE

All-rubber hose has no fabric insertion. Suitable only for negligible pressures. Heavy wall sizes may be used for light vacuum service. All grades have good aging qualities and will last indefinitely without appreciable loss of quality if kept covered and in normal temperatures. All grades are free from any poisonous ingredients and will not impart any taste or color to liquids.



Inside diam., in.	Wall thickness, in.	List price per 100 ft.	Stock sizes				List price, Grade A, Black only
			Grade A White	Grade B White	Grade A Red	Grade B Red	
1/16	1/32	$2.15	*				.....
3/32	1/32	2.26	*				.....
3/32	3/64	2.56	*				.....
⅛	1/32	2.37	*	*	*		.....
⅛	3/32	.....					$10.20
3/16	3/64	3.11			*		.....
3/16	1/16	3.71	*	*	*	*	10.70
3/16	3/32	5.68	*		*		13.70
3/16	⅛	8.10			*		14.80
¼	1/16	4.45	*	*	*	*	11.75
¼	3/32	6.80	*		*		14.20
¼	⅛	9.55	*	*	*		15.65
¼	3/16	.....					18.55
5/16	1/16	5.12	*	*	*	*	12.60
5/16	3/32	7.95	*	*	*	*	.....
5/16	⅛	.....					20.75
⅜	1/16	5.86	*	*	*		.....
⅜	5/64	7.40	*	*	*		.....
⅜	3/32	9.07	*	*	*	*	14.65
⅜	⅛	12.60		*			16.55
½	3/32	11.22	*	*	*		16.10
½	⅛	15.60	*		*		18.35
⅝	⅛	18.65	*		*		20.50
¾	⅛	21.65	*		*		22.35

Grade A White—High grade soft, smooth surface. A general purpose hose for gases and liquids.

Grade B White—Slightly firmer than Grade A. Smooth surface. Used for handling beverages, also for cushioning metal rods on toys, etc. Cost is approximately 25% less than for Grade A White.

Grade A Red—High grade soft red "antimony" stock. Smooth surface. Useful in laboratories, and for conveying gases and liquids. Cost is the same as for Grade A White.

Grade B Red—Firmer than Grade A Red. Smooth surface. Finish free from soapstone. Useful for beverages, and as gas hose. Cost is approximately 25% less than Grade A White.

Grade A Black—Pure plantation rubber, floating stock. Black in color, but blooms light gray. Cured on mandrels in 12-ft. lengths. Cloth impression surface. Recommended for laboratory use. Cost is approximately 85% more than for Grade A White.

Grade 433 Black—Medium quality, smooth surface. A general purpose hose suitable for electrical insulation. Cost is approximately 10% less than Grade A White.

Grade 710 Black—Firmer and less elastic than Grade 433. Also costs less. A general purpose hose. Cost is approximately 40% less than Grade A White.

Boxing—All grades packed 50 ft. to the box, except Grade A Black, which is packed with 4 12-ft. lengths per box.

HARD RUBBER SHEET, ROD AND TUBING

SHEETS

Hard rubber sheets are 20x48 in., edges rough, surfaces polished. Any thickness 1/64 to 4 in. Prices per pound on application.

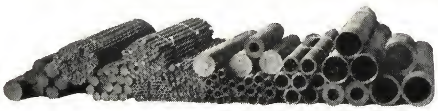
ROD AND TUBING

Furnished any diameter 1/16 to 3 in. Standard length, 30 in. Can be supplied with rough finish, ground finish or polished finish. Prices per pound quoted on application.

GRADES

Made in two black grades, Goodrich and Defiance, the properties of which are as follows:

RESISTANCE TO CHEMICALS



Both Goodrich and Defiance will withstand the action of practically all chemicals except sulphuric acid over 50° Bé, nitric acid over 16° Bé, aniline benzol, carbon bisulphide, chloroform and ethylene dichloride. Defiance has better machining properties.

Description	Goodrich	Defiance
Wt. per cu. in.	.045 lbs.	.043 lbs.
Tensile strength (lbs. per sq. in.)	3500 to 5000	6000 to 9000
Softening temperature (under stress 2500 lbs. per sq. in.)	140° F.	130° F. to 135° F.
Impact strength (in lbs. per sq. in. @ 32° F.)	30	60
Transverse strength (lbs. per sq. in.)	9000	15000
Compressive strength (lbs. per sq. in.)	11000	12000
Coefficient of linear expansion per degree Fahrenheit between 32° F. and 140° F.	.000034	.000035
Dielectric strength (volts per mm.)	25000	40000
Moisture absorption (per cent 24 hrs. immersion @ 70° F.)	.02	.018

SOFT RUBBER BEARINGS

Water-lubricated, grit-proof, with less friction than many oil-lubricated bearings. For use wherever oil lubrication is difficult and water for lubrication available.

Goodrich Cutless Bearings have been used with outstanding success in hydraulic turbines, sand and gravel pumps, hydraulic dredges, deep-well pumps, sand and gravel washers; they are widely known and used in marine service—in fact are rapidly supplanting lignum-vitae, babbitt, and bronze for carrying propeller shafts, in all types of craft. Engineering data, to fit any individual problem, will be supplied on request.

PACKING

ASBESTOS SHEET PACKING:

SUPERHEAT GRADE

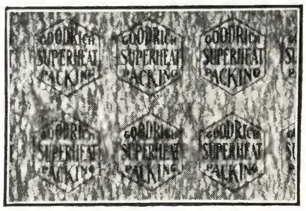
All-service compressed flange and joint packing for steam, air, ammonia, gases, oils, acids, alkalies.

Thicknesses—1/32, 1/16 and ⅛ in. are standard; 3/32, 3/16 and ¼ in. made to order.

Size Sheets—50x50 in., 40x40 in., 40x120 in., 60x60 in., 60x120 in., furnished cross-grained unless ordered straight-grained; 50x150 in., straight-grained only.

Graphited one or both sides, as ordered, without extra charge.

List price per pound, $1.00.



RUBBER SHEET FOR LOW PRESSURES

AKRON RED

Standard quality red sheet packing, 36 in. wide in rolls of approximately 200 lbs. 1/16, 3/32, ⅛, 3/16 and ¼ in. thick. For cold water, hot water and low steam pressures. Soft enough to make a good joint with uneven flanges yet firm enough to resist blowing out. List price per pound, $0.495.

WHITE STAR

Super quality red sheet rubber packing. Extra heat resisting qualities. 36 in. wide; 1/16, 3/32 and ⅛ in. thick. List price, $0.90 per pound. Can also be furnished with brass wire insertion. List price, $1.80 per pound.

SUMMIT OIL RESISTING

Soft black rubber. High tensile strength and elasticity. Sizes 36 in. by 1/16 or ⅛ in. thick. Special thickness made to order in 200-lb. rolls. List price, $1.00 per pound.

DIAPHRAGM SHEET

For cutting regulator diaphragms. Reinforced with a special flexible fabric. Width 45 in. Thicknesses 1/16, ⅛, 3/16 and ¼ in. List price, $1.45 per pound.

CLOTH INSERTED SHEET

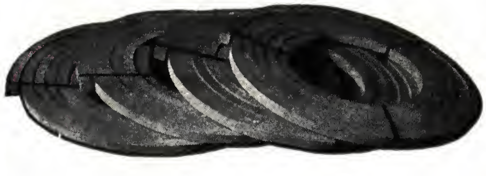
GRADE NO. 60

Width 37 in. Thicknesses 1/16 and ⅛ in. For cold water, air and other low pressure service. List price, $0.58 per pound.

PUMP PACKING

B. F. G. GRADE

Closely woven fabric for hot or cold water. Unequalled for gritty conditions or boiler feed pumps. Furnished rock hard when so ordered. Made in coils 12½ ft. long. Sizes ¼, 5/16, ⅜, 7/16, ½, 9/16, ⅝, 11/16, ¾, 13/16, ⅞, 15/16, 1, 1⅛ in. List price, $1.45 per pound.



METEOR

Similar to B. F. G. Dependable quality for moderate pressures. List price, $1.27 per pound.

STEAM PACKING—SPIRAL

GOODRICH

Fabric and rubber spiral rod packing for steam pressures up to 80 lbs. Lubricated and boxed. 12½ ft. of packing in each spiral. Sizes ¼, 5/16, ⅜, 7/16, ½, 9/16, ⅝, 11/16, ¾, 13/16, ⅞, 15/16, 1, 1 1/16 and 1 3/16 in. List price $2.35 per pound.

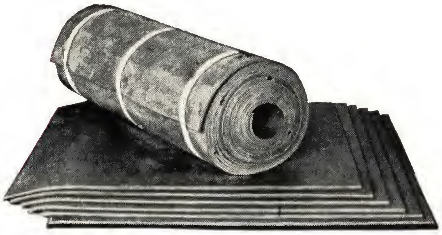
GASKETS

Gaskets can be furnished either plain or graphited from asbestos sheet or rubber sheet in standard sizes or special sizes. Price depends on quantities and sizes.

SHEET AND SLAB RUBBER

GRADE 1170

Medium soft gray rubber of good aging quality and tensile strength for gaskets, bumpers and general utility. Specific gravity 1.49. Width 36 in. Thicknesses, 1/16, 3/32, ⅛, 5/32, 3/16, ¼, 5/16, ⅜, 7/16, ½, ⅝ and ¾ in. List price, $0.77 per pound.



ARMORITE SHEET RUBBER

Armorite is the toughest known compound of rubber. Black in color, soft and elastic. Recommended as a protection against abrasion of sharp materials, wet or dry, in temperatures up to 150° F. Especially effective for lining chutes. In some installations it outwears steel ten to one. Reinforced with a double fabric insertion in the base to serve as an anchorage for screws or nails. Width 48 in.; thicknesses ¼, ⅜ and ½ in.

	List prices
¼ in.	$2.50 per sq. ft.
⅜ in.	3.75 per sq. ft.
½ in.	5.00 per sq. ft.

If service involves impact of heavy lumps special thicknesses may be required. Submit inquiry with full information. Armorite can also be vulcanized directly to the metal by the Vulcalock process. Prices quoted on receipt of inquiry.

GAUGE GLASS GASKETS

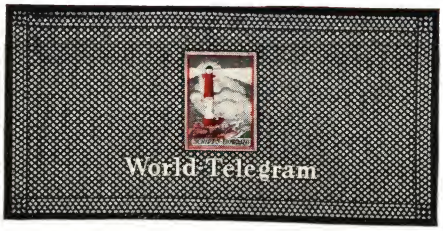
Square section or round section. Sizes ½, ⅝ and ¾ in.

Size, in.	List prices per 100	
	Square section	Round section
½	$0.91	$1.09
⅝	1.03	1.21
¾	1.34	1.35

MATS AND MATTING

DELUXE MATS FOR ENTRANCES: GOODRICH CHROMATEX MATS

By a patented process trademarks, insignia, coats-of-arms, monograms and other designs can be molded into the surface of perforated mats in any number of colors. A distinctive and striking advertisement. Price depends on size of mat and design.



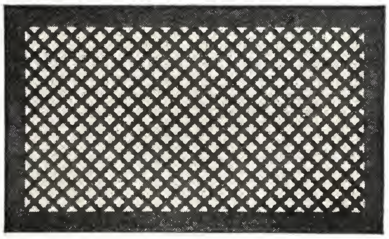
PLAIN PERFORATED MATS

Standard thickness ⅜ in. Can be furnished in black, red, green or white rubber. Sanitary, easily cleaned. Perforations catch mud and dirt in winter and dust in summer, saving floors and rugs inside the buildings. The most efficient and dignified entrance mat for office buildings, corridors, elevator entrances, stores, hotels, clubs, homes, etc.

	List price
⅜ in. thick	$2.20 per sq. ft.
¼ in. thick	1.65 per sq. ft.

VULCATEEN DOOR MATS

Very high quality rubber, ¼ in. thick. Corrugated surface with a variety of deep rich colors permanently vulcanized in. Two sizes, packed six to the carton, in assorted colors.



Size, in.	List price, each
18x30	$3.00
24x36	4.15

SWITCHBOARD MATTING: GRADE 5003

Cloth inserted gray rubber. Corrugated surface. Clean compound with high dielectric strength. Made in accordance with A.S.T.M. electrical requirements. In selecting thickness allow five to one safety factor on dielectric test.

Thickness, in.	Widths, in.	Dielectric strength, volts	List prices per sq. ft.
3/16	36	30,000	$0.615
¼	24, 36, 48	40,000	.78
⅜	30, 36, 48	45,000	1.21
½	36	50,000	1.54

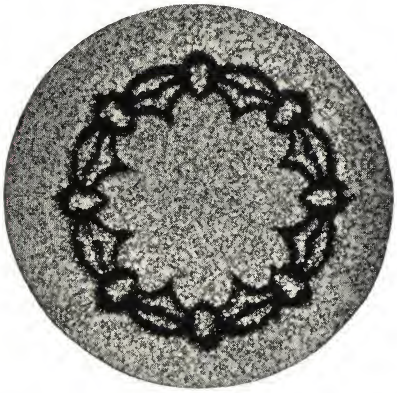
MATTING RUNNERS

Rubber matting made in rolls and sold by the yard. Corrugated surface, clean cut velvety finish. Grade 5050 jet black. Grade 5055 mahogany.

Width, in.	Thickness, in.	List prices per lineal yard	
		Grade 5050	Grade 5055
24	⅛	$1.21	$1.49
27	⅛	1.32	.....
36	⅛	1.76	2.15
48	⅛	2.36	2.86
36	3/16	2.64	3.85
48	3/16	3.52	5.06

CIRCULAR SOLARIUM MATS

Something entirely new. Corrugated surface. Made in beautiful harmonious colors—blue, gold, red and green—not painted on, but impregnated into the rubber for lasting beauty. Useful for flower pots, carafes, cuspidors, coin mats, etc.



Diameter, in.	List price, each
8	$0.165
10	.22
12	.33
15	.44
18	.66

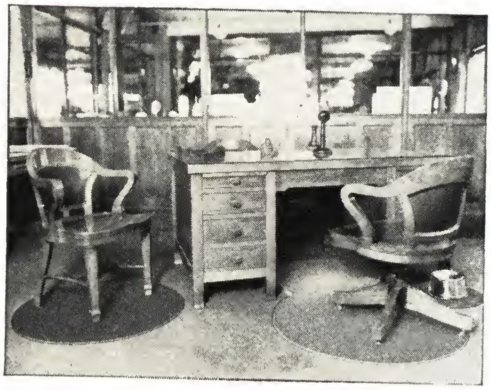
Per carton: 20 assorted sizes, $6.60.

TELEPHONE CUSHIONS

Jet black rubber. Fits over telephone receiver to exclude outside noise. One to the box. List price each, $0.75.

OFFICE CHAIR MATS

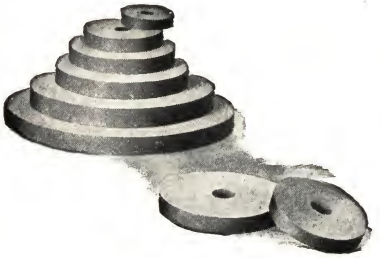
Round mats with extension to go under desk. Smooth surface. Pay for themselves in savings to rugs and floor. Lie perfectly flat.



Diameter, in.	Thickness, in.	List prices, each		
		Black	Chocolate	Green
38	3/16	$8.62	$10.06	......
38	⅛	6.48	8.80	......
40	3/16	9.36	10.94	$12.90
40	⅛	6.96	9.00	......

PUMP VALVES

Special factory service insures shipment in 48 hours after receipt of order. Valves are made to order in exact sizes and grade ordered. In ordering specify which dimension is thickness and which is diameter of hole. If you do not specify the grade, tell us temperature and pressure, and nature of liquid pumped.



Grade	Hardness	Temp.	Press., lb.	Spec. grav.	List price per lb.
240	Bone-hard	212°	250	155	$1.18
60	Semi-hard	170°	250	160	1.38
20	Semi-soft	150°	150	189	1.34
305	Soft	170°	50	192	1.84

GOODRICH VULCALOCK EQUIPMENT

The Vulcalock process is an exclusive, patented Goodrich method of bonding soft resilient rubber directly to the surface of metals with an adhesion exceeding 500 lbs. per sq. in.—practically an integral union. Principal Vulcalock products are:

Vulcalock tanks and tank cars for processing, storage and transportation of acids and other corrosives.

Vulcalock Pipe, Valves and Fittings.

Vulcalock Drums and Barrels.

Vulcalock Fans, Blowers and Pumps.

Rubber covered equipment for abrasive service.

Vulcalock Rolls for Paper Mills, also Steel and Tin Mill Wringer, Scrubber, Galvanizing and Pickling Rolls.

Vulcalock Centrifugal Baskets.

Heavy Duty Vulcalock Steel Pickling Tank with Triflex Rubber Lining ready for installation of sheathing. Inside dimensions 7 ft. 6 in. by 10 ft. 6 in. by 5 ft. 7 in. deep

Special rubber-lined or rubber-covered process equipment.

Vulcalock Pickling and Plating Tanks—Metal working plants may now install steel pickling tanks with Goodrich Triflex rubber linings, consisting of hard rubber imbedded in soft rubber. Expansion joints prevent cracking or distortion of hard rubber under temperature changes. Resistance to impact is nearly 100 times that of ordinary rubber linings. Protective sheathings of wood or brick are installed to insure freedom from damage. Brick sheathings also provide temperature drop to insulate rubber from high temperatures. These pickling tanks are leak-proof, durable, economical and can be very easily repaired with very little loss of time. Full information will be submitted on request.

ACID RESISTING PAINT

Goodrich Acidseal Paints, developed and patented by the Goodrich Research Laboratories, possess great adhesive properties, elasticity, resistance to acids, alkalies and moisture.

Uses—Protection against corrosive fumes such as acids, alkalies, salt, etc., for structural steel, pipe lines, machinery walls, tank cars, drums, magnesium-aluminum alloys, laundry equipment; covering of metal sheets subject to flexing; priming coat for nitro-cellulose lacquer films.

Limitations—Deteriorate in direct sunlight. Must not be expected to stand abrasion better than ordinary paint.

Acidseal Paint 1009—Cream color, no priming coat required. List price, $8.35 per gallon.

Acidseal Paint 1011—Gray. Withstands temperatures up to 220° F. Requires primer of red lead on metal and Goodrich Acidseal Primer No. 3 for concrete. List price, $9.70 per gallon.

Acidseal Paint 1014—Silver gray. Contains aluminum powder. No priming coat required, although red lead or chromate primers may be used where desired. List price, $11.00 per gallon.

Acidseal Paint 1021—Brown. Used as a primer for lacquers. List price, $9.00 per gallon.

All Acidseal Paints can be applied with a brush and dry in about one hour. Sold in gallon cans.

GOODRICH RUBBER CEMENTS AND PLASTIC COMPOUNDS

Goodrich manufactures more than 200 solutions or suspensions of rubber, commonly known as rubber cements. Following is a list of the principal grades. Additional information and prices will be furnished on request.

Goodrich No. 1—Highest quality pure gum rubber cement.

Goodrich No. 4—Same as No. 1, but slightly thinner.

Goodrich Upholstery Cement—For temporary adhesion in assembly work.

Goodrich Wood Rim and Gasket Cement.

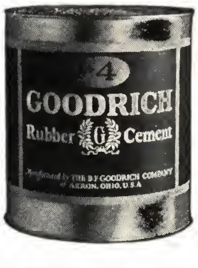
Goodrich No. 3 Railroad Coupling and Steam Hose Cement—For applying hose couplings.

Goodrich "J" Cement—Rapid drying.

Goodrich "M" Cement—Non-toxic, non-freezing solvent.

Goodrich Stationers' Cement—Light color. Non-toxic, non-freezing.

Goodrich Plastikon No. 169—Adheres to wood or metal. Will not become brittle.



Waterseal No. 9—Inserted in wood and metal joints to prevent squeaking. Paste consistency.

Spraying Waterseal DX-12 — Same as No. 9 except can be handled with a brush or spray gun.

No. 57 Plastic—Putty-like consistency. Applied with putty knife or paddle. Adheres to metal, wood, leather, etc. Shrinks little, leaving good thick layer when dry.

No. 50 and No. 51—Air-cured type. Two solutions mixed together before use.

Goodrich No. 54 and 55—Similar to Nos. 50 and 51, but with greater strength. Used in making rubber lifeboats and similar processes.

Goodrich Airship Seam Solution No. 1 and No. 2.

Goodrich No. 60 and No. 61—Hot vulcanizing type.

Goodrich No. 52—White vulcanizing cement.

Goodrich No. 53—Black vulcanizing cement.

Goodrich "Jiffy" Solution—Extreme adhesion to leather and rubber.

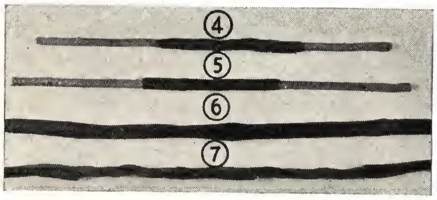
Containers—Cans of all sizes, 1-qt. and 5-gal., also 30-gal. and 55-gal. drums. Some solutions can also be furnished in ¼-pt. bottles and various sizes of collapsible tubes.

Rubber cements are volatile and inflammable. Insurance companies require special storage facilities.

GOODRICH MISCELLANEOUS RUBBER PRODUCTS

TWO-IN-ONE COMBINATION RUBBER AND FRICTION TAPE

Insurance requirements demand that insulation on electrical joints shall be equal to the original insulation on the wire. This safety cannot be insured by the use of friction tape alone. Two-in-one tape provides ample thickness of rubber insulation, plus the friction tape, in one product. Repeated windings are unnecessary. A small piece of the tape folded over the bare wire is sufficient to provide ample voltage resistance up to 220 volts. A double thickness may be used up to 660 volts. Extremely adhesive. Amalgamates itself with slight pressure. Also useful for mending purposes. Furnished in half pound rolls, 10 lbs. per shipping case. Tested and listed by Underwriters' Laboratories. List price, $1.35 per pound.



Joints with Two-in-one Tape

FLEXITE BUCKETS AND DIPPERS

To insure greater safety for workmen in handling corrosive liquids. Made of Goodrich Flexite, a flexible hard rubber. Nothing short of actual destructive abuse will crack or break it. Lead covered handle, fitted in such a manner as to permit nesting of buckets.

		List price, each
Buckets	Lead covered handles	$12.10
	Rubber covered handles	13.80
2-qt. dippers		7.30
1-qt. dippers		5.60

GLOBE VALVE DISCS: GOODRICH HIGH DUTY

For replacements in disc-type brass globe valves. Orders should specify oval hole or round hole.

Bone-hard high quality composition affords highest resistance to heat and pressure. Recommended for steam pressures up to 200 lbs. per square inch.

Size, in.	No. to box	List price, each	Size, in.	No. to box	List price, each
¼	200	$0.03	3	25	$ .40
⅜	200	.04	3½	25	.50
½	200	.04	4	10	.60
¾	100	.05	4½	10	.70
1	100	.06	5	10	.80
1¼	100	.09	6	10	1.00
1½	50	.12	7	..	1.20
2	50	.18	8	..	1.40
2½	50	.24			

PUMP DIAPHRAGMS

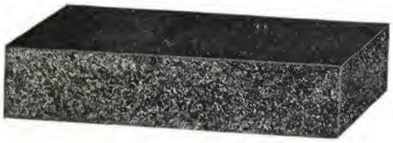
Designations refer to size and make of pump for which diaphragm is desired. Loud diaphragms may also be used on Deming pumps and Edson diaphragms on Rumsey pumps.

Size	List price, each	Size	List price, each
No. 1 Loud	$1.94	No. 4 Edson	$3.76
No. 2 Loud	2.62	No. 2 Gould	2.40
No. 2 Edson	2.40	No. 3 Gould	2.88
No. 3 Edson	2.88	No. 4 Gould	3.76

SPONGE RUBBER

Made in slabs 20x20 in. Suitable for gaskets, cushions, packings, pads, vibration insulators and hundreds of other uses.

Grade A—Red, medium soft, medium weight.
Grade B—Black, firm and heavy.
Grade C—Tan, very soft and light.
Grade E—Black, soft, medium weight.



LIST PRICES PER SLAB 20x20 INCHES

Thickness, in.	A Red	B Black	C Tan	E Black
⅛	$1.14	$1.56	$1.28	$1.14
⅛ *	.77	.....	.....	.77
3/16	1.34	1.98	1.36	1.34
¼	1.43	2.32	1.63	1.47
5/16	1.69	2.42	1.91	1.72
⅜	1.89	2.66	2.18	1.98
7/16	2.09	.....	2.35	2.31
½	2.27	3.30	2.53	2.53
⅝	2.77	4.18	2.62	3.01
¾	3.41	4.75	2.93	3.45
1	4.03	5.96	3.70	4.49

*Skin one side only.

RESPIRATORS

A safety appliance for the protection of workmen from dust and smoke. White soft rubber furnished complete with straps, sponges, valves, etc. One to the box. List price, $1.35 each.

ANODE GLOVES

Made by exclusive Goodrich Anode process imparting much greater toughness and resistance to wear than ordinary gloves.

Cat. No.	Type	Lgth., in.	Sizes	Pairs per box	List price per doz. pairs
2914	G'tlet, acid	14	8½ 9½ 10 10½ 11	1	$30.00
2924	G'tlet, fabric lined, acid	14	10½ 11	1	54.00
2918	G'tlet, acid	18	10 10½ 11	1	36.00
570	Industrial, no g'tlet	11	9 10 10½ 11	6	16.00
560	Household no g'tlet	11	6½ 7 7½ 8 8½ 9 9½ 10 10½ 11	12	6.40

DISTRIBUTORS OF GOODRICH INDUSTRIAL SUPPLIES

ALABAMA

BIRMINGHAM	Young & Vann Supply Co.

ARKANSAS

BLYTHEVILLE	Hubbard Hdwe. Co.
HOT SPRINGS	F. C. Stearns Hdwe. Co.
LITTLE ROCK	Central Supply Co.

CALIFORNIA

LOS ANGELES	Los Angeles Rubber & Asbestos Co.
	Republic Supply Co. of Calif.
SAN DIEGO	Hazard-Gould Corp.
SAN FRANCISCO	Dunham-Carrigan-Hayden Co.
	H. L. Parkman Co.
SAN JOSE	Farmers Union

COLORADO

DENVER	Harry H. Post Co.
GRAND JUNCTION	Salt Lake Hardware Co.
PUEBLO	Holmes Hdwe. Co.

DELAWARE

WILMINGTON	Wood-Krewson Co.

DISTRICT OF COLUMBIA

WASHINGTON	Standard Automotive Supply Co.
	Raymond & Burke

FLORIDA

JACKSONVILLE	S. B. Hubbard Co.
ORLANDO	Harry P. Leu, Inc.
TALLAHASSEE	Seabrook Hardware Co.

GEORGIA

ATLANTA	Beck & Gregg Hardware Co.
AUGUSTA	Lombard Iron Works & Supply Co.
MACON	Schofield Iron Works
SAVANNAH	Jno. D. Robinson Co.
THOMASVILLE	Thomasville Hdwe. & Supply Co.

IDAHO

BOISE	Salt Lake Hardware Co.
POCATELLO	Salt Lake Hardware Co.

ILLINOIS

CAIRO	Woodward Hdwe. Co.
CHICAGO	W. D. Allen Mfg. Co.
DECATUR	Morehouse & Wells Co.
JACKSONVILLE	Jacksonville Farm Supply Co.
OLNEY	Hudson-Hill Company

INDIANA

INDIANAPOLIS	Central Rubber & Supply Co.

KANSAS

KANSAS CITY	Stone, L. R. Supply Co.

KENTUCKY

LEXINGTON	Wilson Machinery & Supply Co.
LOUISVILLE	Louisville Mill Supply Co.
PADUCAH	Farr-Better Supply Co.

LOUISIANA

MONROE	Monroe Hdwe. Co.
NEW ORLEANS	R. J. Tricon Co.
SHREVEPORT	L. N. Pevey

MAINE

PORTLAND	Portland Rubber Co.

MARYLAND

CUMBERLAND	Tri-State Mine & Mill Supply Co.

MASSACHUSETTS

BOSTON	Curry Bros. Oil Co.
	C. J. McCarty Co.
FALL RIVER	Fall River Rubber Co.
FITCHBURG	Hope Rubber Co.
LAWRENCE	Lawrence Rubber Co.
NEW BEDFORD	New Bedford Rubber Co.

MICHIGAN

DETROIT	C. L. Gransden & Co.
FLINT	C. L. Gransden & Co.
GRAND RAPIDS	Barclay, Ayers & Bertsch
KALAMAZOO	Jos. E. Loughead Co.
PETOSKEY	McCabe Hdwe. Co.
SAGINAW	Reichle Supply Co.

MINNESOTA

DULUTH	Wm. B. Arper Co.
ST. PAUL	Goodrich Silvertown Inc.

MISSOURI

JOPLIN	Joplin Supply Co.
KANSAS CITY	Pioneer Equipment Co.
	L. R. Stone Supply Co.
ST. LOUIS	O. B. Avery Co.
	Witte Hdwe. Co.

MONTANA

KALISPELL	Kalispell Mercantile Co.

NEBRASKA

LINCOLN	Henkle & Joyce Hdwe. Co.

NEW HAMPSHIRE

MANCHESTER	Hope Rubber Co.

NEW MEXICO

SANTA FE	Santa Fe Builders Supply Co.

NEW YORK

ALBANY	Sager-Spuck Supply Co.
BINGHAMTON	Ellis W. Morse Co.
BOLIVAR	R. B. Moore Co.
BUFFALO	Don F. Johnson Co.
JAMESTOWN	Lundquist Hardware, Inc.
NEW ROCHELLE	Commercial Garage & Service Co.
NEW YORK	Topping Bros.
OLEAN	Miller Hardware Co.
POUGHKEEPSIE	Walter F. Wheeler Inc.
WATERTOWN	Kamargo Supply Co.

NORTH CAROLINA

FAYETTEVILLE	Cape Fear Supply Co.
HAMLET	Carroll-Hoe Saw Service
WILMINGTON	Hyman Supply Co.

OHIO

AKRON	M. F. Murdock Company
CLEVELAND	Geo. Worthington Company
COLUMBUS	Columbus Belting & Supply Co.
DAYTON	Sterling Rubber Products Co.
FINDLAY	Ohio Pipe Co.
NEWARK	Universal Supply Co.
NEW PHILADELPHIA	Sharp Mfg. & Supply Co.
TOLEDO	Union Supply Co.
YOUNGSTOWN	Stambaugh-Thompson Co.

OKLAHOMA

OKLAHOMA CITY	Land Supply Co.
TULSA	Lucey Products Corp.
	Tulsa Rubber Products Co.

OREGON

PORTLAND	Pacific States Rubber Co.

PENNSYLVANIA

ALLENTOWN	H. N. Crowder, Jr. Co.
BRADFORD	Lloyd, Smith Co.
CHESTER	John Bridge's Sons
EASTON	H. N. Crowder, Jr. Co.
ERIE	United Hardware & Supply Co.
HARRISBURG	Appleby Bros. & Whittaker Co.
PHILADELPHIA	Belmont Packing & Rubber Co.
	Theo. C. Ulmer, Inc.
PITTSBURGH	Speck Marshall Company
READING	Brown Engineering Co.
SCRANTON	Chas. B. Scott Co.
WILLIAMSPORT	Carl Wentzler Tire Shop

RHODE ISLAND

PROVIDENCE	Hope Rubber Co.

SOUTH CAROLINA

GREENVILLE	Carolina Supply Co.
SUMTER	B. L. Montague

TENNESSEE

CHATTANOOGA	James Supply Co.
KINGSPORT	Slip-not Belting Corp.
KNOXVILLE	Tennessee Mill & Mine Supply Co.
MEMPHIS	Pidgeon Thomas Iron Co.
NASHVILLE	Keith-Simmons Co. Inc.

TEXAS

AMARILLO	Cal Farley Tire Shop
CORPUS CHRISTI	San Antonio Machine & Supply Co.
DALLAS	Briggs-Weaver Mchy. Co.
ELECTRA	Decker Tool & Supply Co.
EL PASO	Tri-State Sales Co.
FT. WORTH	Marlow Belting & Hose Co.
HOUSTON	W. H. Steigerwald Co.
JOINERVILLE	Decker Tool & Supply Co.
SAN ANTONIO	San Antonio Machine & Supply Co.
WACO	San Antonio Machine & Supply Co.

UTAH

SALT LAKE CITY	Salt Lake Hardware Co.

VERMONT

BARRE	Reynolds & Sons

VIRGINIA

EMPORIA	W. T. Tillar Co.
HARRISONBURG	E. T. Garber & Sons
NEWPORT NEWS	Noland Co.
PULASKI	C. I. Hiltzheimer
RICHMOND	Richmond Rubber Co.
	Jerry Bros. Belting Co.
ROANOKE	Graves Humphreys Hdwe. Co.

WASHINGTON

HOQUIAM	F. G. Foster Co.
OLYMPIA	Olympia Supply Co.
RAYMOND	F. G. Foster Co.

WEST VIRGINIA

FAIRMONT	Fairmont Supply Co.
MARTINSBURG	W. H. Heiston & Son
PARKERSBURG	Parkersburg Supply Co.
WHEELING	Penna. & W. Va. Mine Supply Co.

WYOMING

CASPER	Casper Supply Co.

BRITISH COLUMBIA

VANCOUVER	Fleck Bros. Ltd.

HONOLULU

HONOLULU, T. H.	Honolulu Iron Works Co.

NEW BRUNSWICK

ST. JOHN	Estey & Co.

QUEBEC

QUEBEC	Rene Talbot

B.F.Goodrich